# The OIL and GAS JOURNAL

PRODUCING REFINING PIPELINE ENGINEERING MARKETING

VOL. 30. NO. 33 TULSA, OKLAHOMA, DECEMBER 31, 1931


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# Sunday Shut Down Gets Results Quickly

Highest production in 1930, week ending Feb. 22, average daily output 2,699,096 bbls. Peak of U. S. production, week ending Aug. 24, 1929, average 2,975,435 bbls.

## Crude Oil Production Registers One of Greatest Declines in History of Industry. Texas' Co-operation Encouraging

By Andrew M. Rowley

Lowest daily average crude oil production in the United States during 1930 was for week ending Dec. 27 with average output of 2,144,074 bbls.

Greater results were achieved more quickly through the Sunday shutdown movement than most oil men had expected. An especially encouraging sign is the hearty co-operation extended by operators throughout Texas, that State registering a drop in production last week of more than 102,000 barrels daily. Of interest in considering the production situation as a whole is the fact the output of all fields of the United States, except East Texas which entered the production column this year, dropped to a lower average last week than for any other week since 1926. In other words, oil fields of the United States, outside of East Texas, produced last week 171,000 barrels daily less than at any other time since 1926.

With the beginning of the new year, the allowable production for Oklahoma will be reduced 71,000 barrels daily, and that of Kansas an average of about 5,000 barrels daily. Consequently, if an effective Sunday shutdown movement is continued through this winter a balance will be maintained between supply and demand which will eliminate any threat of a weakened price structure and which will permit the industry to enter the main consuming season of 1932 in an especially advantageous position.

Trouble is being experienced in California in obtaining support of all operators for the reduced allowable set for that state for the beginning of the year. However, a number of reports from that state indicate the potential production figure is not as great as many had thought and the California situation will not have any appreciable effect upon the remainder of the country.

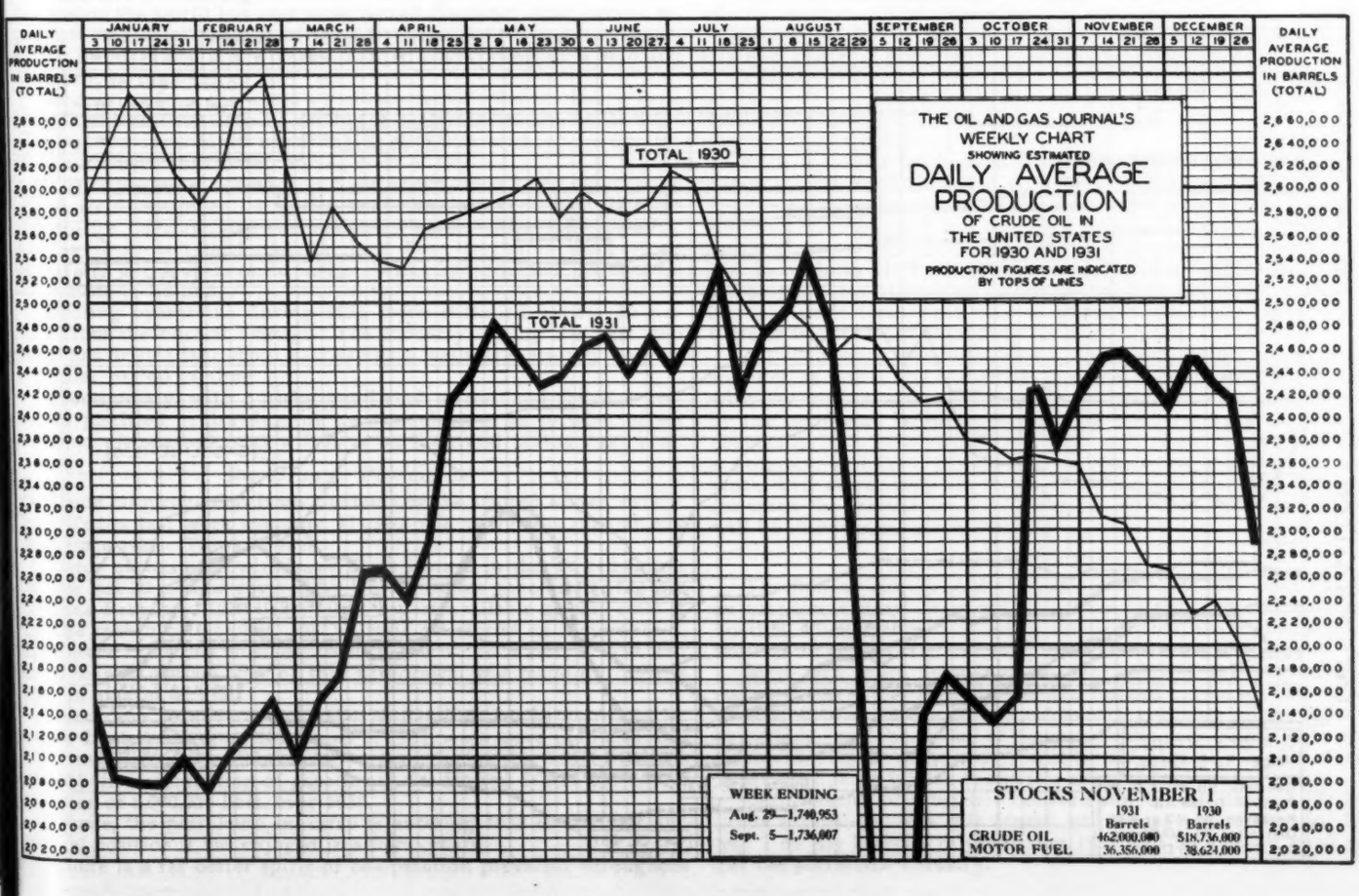
There is a growing spirit of optimism regarding the outlook. Many operators who not more than three weeks ago were frankly pessimistic now believe conditions in 1932 will be quite materially improved.

### PRODUCTION IN THE UNITED STATES

Estimated daily average production of crude oil in the United States for week ended December 26 and a comparison with the previous week follows:

| | Dec. 26 | Dec. 19 |
|---|---|---|
| Oklahoma— | | |
| Oklahoma City | 171,215 | 186,635 |
| Seminole-St. Louis | 146,320 | 141,520 |
| Remainder of State | 216,845 | 216,690 |
| Total Oklahoma | 534,380 | 544,845 |
| East Texas— | | |
| Kilgore | 104,435 | 125,510 |
| Lathrop | 105,056 | 128,763 |
| Joiner | 106,505 | 126,180 |
| Total East Texas | 315,996 | 380,453 |
| West Texas | 176,954 | 198,596 |
| North Central Texas | 78,960 | 80,384 |
| Texas Panhandle | 51,494 | 52,475 |
| East Central Texas | 50,317 | 56,835 |
| Gulf Coast—Texas | 110,205 | 114,256 |
| Southwest Texas | 60,695 | 63,996 |
| Total State of Texas | 844,621 | 946,995 |
| North Louisiana | 27,535 | 27,890 |
| Arkansas | 33,040 | 34,260 |
| Kansas | 105,120 | 107,570 |
| Gulf Coast—Louisiana | 29,720 | 33,650 |
| Eastern | 124,000 | 124,000 |
| Rocky Mountain | 92,274 | 93,097 |
| California— | | |
| Santa Fe Springs | 63,000 | 63,000 |
| Long Beach | 76,750 | 76,000 |
| Playa Del Rey | 21,000 | 21,500 |
| Elwood | 15,000 | 21,750 |
| Kettleman Hills | 60,000 | 61,500 |
| Remainder of State | 262,250 | 262,750 |
| Total California | 498,000 | 506,500 |
| Total United States | 2,288,690 | 2,418,807 |

→ Decrease 130,117 Bbls. Daily ←



# Stop Slump in Oklahoma Gasoline Price

## Sellers Refuse to Give Additional Concessions With More Inquiries From Buyers. Need Curtailment of Operations

By C. O. Willson

The steady decline in refinery tank car prices at Oklahoma (Group 3) refineries and those located in other Mid-Continent and Middle West refining areas was apparently stopped the first of the week when sellers refused to give additional concessions to buyers. With more inquiries from the latter many of the trade were confident that the next turn in the market would be upward.

Among the remaining products, kerosene maintained its recent price advances and all the better grades of furnace oil were scarce and either firm or higher in price. The heavier fuels are still not active but there were no important changes in prices. Sales of Grade AA natural gasoline in Oklahoma were made the latter part of last week under 2 cents but prices had recovered to the 2-cent level the first of the week although cheaper material was available from Texas plants. Trading in lubricating oils continued along routine lines with no general changes in quotations.

The predicted improvement in the gasoline market is based on expected changes both in demand and supply. On the demand side it is an axiom that jobbers reduce their purchases to a minimum on a declining gasoline market, particularly when it occurs during the winter period of decreasing consumption. They also rush into the market when they become convinced that prices will not go lower. The slow buying of the past two weeks is also accounted for by the desire of the jobbers to reduce their storage to a minimum at the end of the year. With the year ended many market observers expect this situation to change and both spot and contract buying will improve. The inquiries from jobbers and marketers on Monday and Tuesday pointed to this development. The buyers were particularly anxious to obtain flat price quotations over a part or all of January.

On the supply side every indication at this time points to decreased refinery operations in Oklahoma and the remainder of the Mid-Continent during January. The fact that substantial advances in gasoline tank car prices is necessary before many refiners can show a profit has already closed down several plants and additional shutdowns or curtailments are in prospect after the first of the year. This curtailment of plant operations will be aided by the reduction in allowable crude oil production already effective in several Mid-Continent fields and which in Oklahoma will mean a reduction to 475,000 bbls. daily after the first of the year. This curtailment should result in reduced runs at several of the larger refineries which obtain their crude oil from Texas and Oklahoma fields.

### Need Curtailment

That the Mid-Continent area is in need of a substantial reduction in crude oil runs to stills is apparent from a study of the accompanying table compiled from the weekly reports of the American Petroleum Institute. In contrast to the situation for the country as a whole, the Mid-Continent refining industry is closing the year with more gasoline and gas oil and fuel oil in storage than it had the previous year. The A. P. I. report for the week ending December 19 shows that gasoline stocks at refineries in the United States on that date totaled 35,936,000 bbls., which compares with the 39,016,000-bbl. total for the same date last year. Practically all of this decrease is accounted for by California where gasoline stocks on December 19 of this year were 2,874,000 bbls. less than the corresponding date of the previous year.

In regard to fuel oil and gas oil stocks the total at United States refineries on December 19 was 137,017,000 bbls., which was a decrease of 3,109,000 bbls. for the year. However, during this period California stocks of fuel oil and gas oil decreased 7,475,000 bbls., so that outside of the west coast state there has

(Continued on Page 109)

### REFINED MARKET BAROMETER

A holiday dullness was reported in practically all refining areas during the past week. There was little new buying and shipments were largely confined to routine orders. For the first time in several weeks there were indications that gasoline tank car prices in the Mid-Continent had reached bottom with improvement predicted by many after the first of the year. Kerosene quotations were generally strong both for domestic and export shipment. Furnace oils firm. No general changes were noted in the heavier oils. Although the movement was slow, prices of steam refined stocks, bright stocks and neutral oils were generally unchanged. More activity reported in wax market.

**Mid-Continent**—More active spot and contract market in refinery gasolines first of week. Natural gasolines stronger than last week. Kerosene and furnace oils firm. Heavy fuels dull. Reductions in some grades of neutral oils. Wax unchanged.

**East Coast**—Little trading during holiday season. Refiners closing contracts on fuels for one to three years. Gasoline demand slow and prices reflect weakness. Kerosene strong. Furnace oils active. No price changes in lubs and wax.

**Chicago**—Gasoline market weak but sellers expect improvement after first of year. Kerosene firm. Fuel oil and gas oil weak.

**Pennsylvania**—Market on all products quiet. Kerosene prices firm.

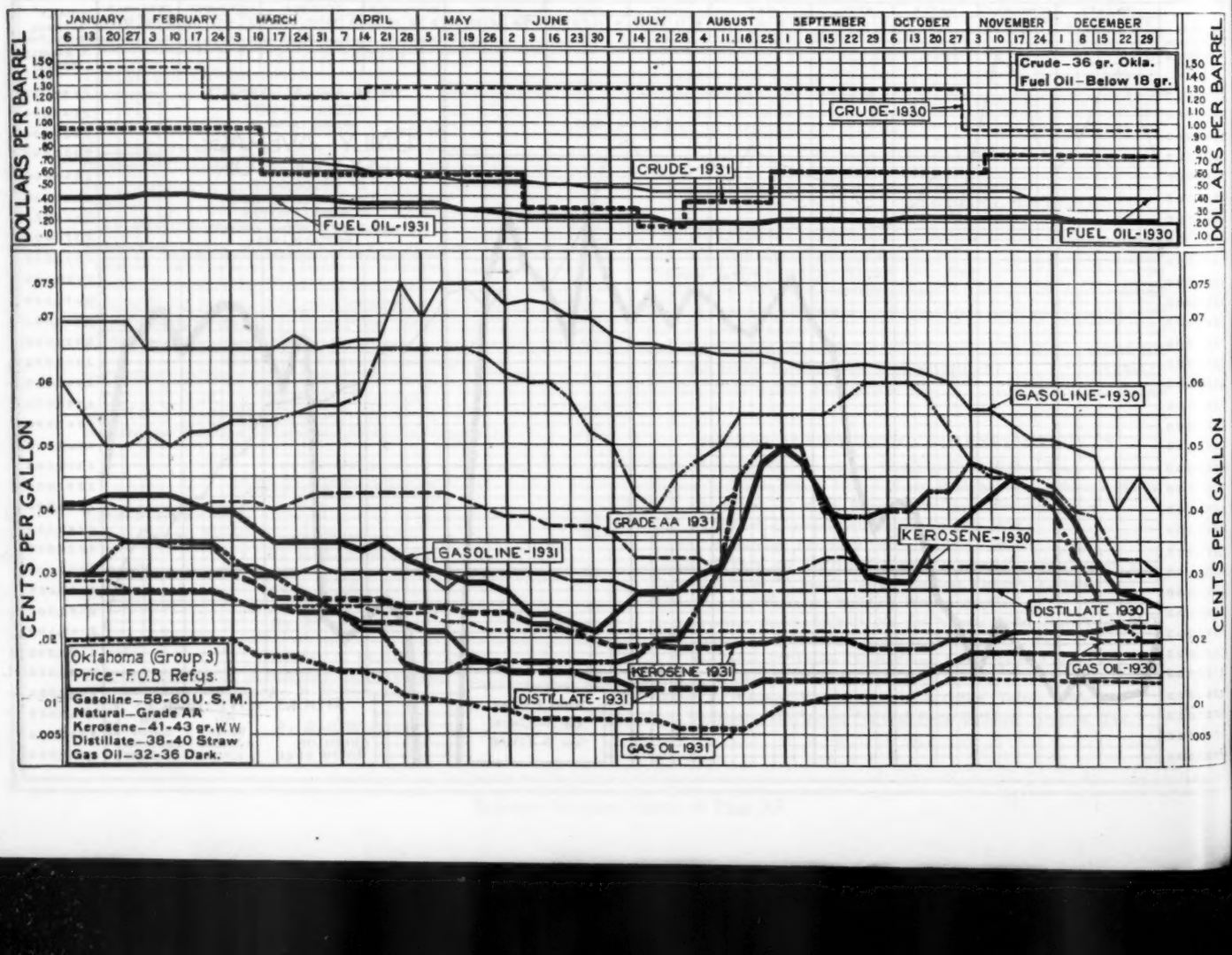
**Gulf Coast**—Prices steady with few new inquiries. Gasoline demand slow.

**California**—Gasoline market not so strong. Other products unchanged.

**MID-CONTINENT REFINERY OPERATIONS (Barrels)**

| | Week ending Dec. 19, 1931 | | | Week ending Dec. 20, 1930 | | |
|---|---|---|---|---|---|---|
| | Dly. crude oil runs to stills | Gasoline stocks | Fuel oil and gas oil stocks | Dly. crude oil runs to stills | Gasoline stocks | Fuel oil and gas oil stocks |
| Oklahoma, Kansas, Missouri | 237,600 | 3,324,000 | 4,305,000 | 245,300 | 2,628,000 | 4,408,000 |
| Inland Texas | 125,700 | 1,707,000 | 3,061,000 | 138,900 | 1,392,000 | 2,648,000 |
| North Louisiana-Arkansas | 56,700 | 142,000 | 791,000 | 49,300 | 269,000 | 923,000 |
| Total | 420,000 | 5,173,000 | 8,157,000 | 433,500 | 4,289,000 | 7,979,000 |

Data obtained from A. P. I. report.



# Conditions Indicate Good Year Ahead

## Statistical Position, Better Co-operative Spirit, Low Equipment Inventories and Postponed Drilling Are Important Factors

By Andrew M. Rowley

The thought uppermost in the mind of every oil man at this time seems to be "What is the outlook for 1932?"

Predicting what may happen in the oil business for even 30 days ahead is enough to place a person in the same category as a weather prophet in Texas—he either is a fool or a newcomer.

But, with its own staff men located in every oil news center of the United States, I believe The Oil and Gas Journal is especially well fitted to summarize those facts which bear on the present situation and which will, to a very great extent, shape the trend during the year we now are entering.

The background of the picture is definite. We know what production of crude oil has been and what it is now. We know what quantities of crude there has been in storage; what withdrawals have been made; and the total of these stocks at this time. We have the same figures relating to gasoline manufacture, storage and consumption. That gives us the statistical position.

### *Closer Co-operation*

Everyone is more or less familiar with the spirit of tolerant skepticism which greeted The Oil and Gas Journal's editorial of April 28, 1927, entitled "It Can Be Done" when this publication launched a campaign to stimulate co-operation within the petroleum industry to stabilize conditions and curtail production. It was almost a byword in the industry at that time you could not get any two oil men to agree on what day of the week it was, let alone to agree to reduce their production. Now we see crude oil production in the Mid-Continent and Gulf Coast areas of the country reduced about 120,000 bbls. daily in one week chiefly through an entirely voluntary shutdown of producing wells on Sunday, and this result achieved within a week after such a movement was proposed. That gives us a good indication of the change in spirit in the industry and the development and growth of co-operation for the common welfare.

We know that during the entire time of the most severe business depression the world has ever experienced domestic consumption of gasoline, the chief product of the petroleum industry, has actually shown an increase. That means a lot in considering what is to be expected during 1932.

Production from the world's greatest light oil fields—East Texas and Oklahoma City—can be set fairly definitely at this time. This removes the uncertainty regarding these fields with which the industry has been confronted during most of 1931.

It is conceded oil companies have drawn upon their inventories of oil field equipment, supplies and material to the extent such inventories have reached the vanishing point. Also that concerns dealing in second-hand material have been forced to discontinue operations because there no longer is any second-hand material or equipment to be had.

Drilling operations during 1931 were curtailed almost 50 per cent from the normal average. The industry during the past two years has drilled just about half as many wells as it usually does in a similar period of time.

Consequently, with a background such as outlined above, a person is justified in drawing his own conclusions as to what effect these conditions and facts will have on the trend during next year.

### *Big Drop in Production*

Crude oil production from all fields of the United States, except East Texas, last week averaged 171,380 bbls. daily less than at any time since 1926. Think it over.

Crude oil has been withdrawn from storage in the United States for the last 20 months covered by United States government reports or since February, 1930. The latest report available at this time is for the month of October, 1931. Crude oil stocks on November 1, 1931, were 77,000,000 bbls. less than they were on March 1, 1930, and more than 49,000,000 bbls. of this withdrawal was made during the first 10 months of 1931.

According to government reports, gasoline stocks at refineries in the United States on November 1, 1931, were more than 2,000,000 bbls. less than on November 1, 1930. And, during the first 10 months of 1931 the consumption of gasoline in the United States showed an increase of 8,000,000 bbls. over 1930.

Hence, the petroleum industry is entering 1932 in the best statistical position it has enjoyed in several years.

There is a far better spirit of co-operation prevalent throughout the industry than even during the early part of 1931. It no longer requires a month of meetings, arguments and bickering to decide upon the quantity of crude oil which should be produced in a state to balance supply and demand. And state officials are realizing more all the time that recognized leaders of the oil industry are fair and square in their dealings and are making a sincere effort to stabilize the industry. This realization facilitates co-operative action upon the part of state bodies.

### *Situation in East Texas*

East Texas will never again be permitted to demoralize the industry with a flood of cheap crude oil sold at whatever price might be offered. Producers there realize fully a stabilized market means far more money in their pockets for much less oil. The output of East Texas will be held around the 400,000-bbl. mark as a maximum.

Estimates of total recovery from the East Texas pools, made at a recent meeting of geologists held in East Texas, are regarded as entirely too high by well-informed oil company officials and others. Water encroachment and loss of bottom hole pressure are serious problems in that field and cold weather is expected to present great difficulties because of the paraffin in the East Texas crude. However, regardless of ultimate recovery, the industry knows what it can expect from East Texas in the way of total daily average production and an average of around 400,000 bbls. daily can be accepted for a great part of 1932 at least.

Operators in the Oklahoma City Field will not increase their production much above present levels because of danger of water encroachment and the absolute necessity of maintaining a back pressure on wells to procure the greatest oil recovery. Big investments in that pool make it imperative that production be curtailed to minimize water hazards in order that companies may realize upon their investments.

### *Increase in Field Work*

The view expressed last July by Wallace E. Pratt, Director of the Humble Oil & Refining Co. that the petroleum industry would have to drill 20,000 wells a year to maintain its crude oil supply and to meet requirements has gained adherents steadily, and it is generally conceded Mr. Pratt's reasoning is sound. There were 21,232 wells completed in 1930, a decrease of more than 5,000 from 1929, while during 1931 there have been completed only approximately 12,375 wells.

With expected production from East Texas fairly well determined and Oklahoma City forced to hold its output to certain limits to conserve the oil and prevent the field from being ruined by water, the petroleum industry will have to increase its field operations during 1932 to create a reserve for future requirements. Every effort will be made to prevent anything savoring of an excessive drilling campaign, but a number of companies already are making plans to increase their field work and to improve properties upon which little or no work has been done for a year or so.

All such work will necessitate the buying of all material and supplies, as few if any companies have material on hand to go ahead with any work program. Far more new equipment will be purchased by the petroleum industry during 1932 than during 1931. The oil companies have been conserving their cash resources for just such a program. Oil field supply houses should begin at this time to stock their stores with everything used by the petroleum industry, for when the demand for material starts it will be heavy and buyers will be insistent on quick delivery.

### *Better Prices Expected*

The Sunday shutdown movement inaugurated last week has had an auspicious start. If operators adhere to the plan and hold production of crude oil to or below requirements, there should be an increase in crude oil prices early in 1932.

More and more companies in the industry are beginning to realize better prices for crude oil and refined products must be procured before there can be any substantial recovery of the industry as a whole from the period of distress prices and unprofitable operations. Prices of all products will be substantially higher during 1932 than during 1931 or the writer certainly misses his guess.

Maintenance of a balance between supply and demand for both crude and refined oils, this winter, will insure a good start for 1932, and I do not hesitate in predicting 1932 will be a really good year for the petroleum industry.

# Foreign Oil Exports to United States

## Seven Countries Ship Oil Here, but Only Four Send Refined Products. Tariff Commission Report on Plants Exporting to Us

Seven foreign countries exported each to the United States during the period January 1, 1929, to December 31, 1930, more than 2,000,000 bbls. in the aggregate of crude petroleum and of the refined products, only four of them exported any refined products to the United States, namely, the Netherland West Indies, Mexico, Trinidad and Venezuela; the quantity exported directly from Venezuela was relatively small. Table 1 summarizes the refining facilities in the seven foreign countries.

### Mexico

According to the best information available only five refineries operated in Mexico during the period from January 1, 1929, to December 31, 1930.

At Tampico, there are three "complete" plants (i.e., plants making all classes of finished products) equipped to run a total of some 195,000 bbls. of crude petroleum daily. One authority states that the present daily topping capacity of plants at Tampico is approximately 80,000 bbls. The only asphalt plant in Mexico—capacity, 6,000 bbls.—is at Tampico, as is also a wax plant with a capacity of 1,200 tons per month.

At Tuxpam, there is one topping plant equipped to treat some 15,000 bbls. of crude petroleum daily in the production of a complete line of refined products and at Minititlan, there is one complete plant equipped to run some 20,000 bbls., or more, of crude petroleum daily. Practically all the lubricating oil produced in Mexico is refined at this plant.

In recent years a number of other refineries in the district around Tampico and around Tuxpam (Port Lobos) have been shut down, and some have been dismantled. As far as could be learned, no refinery at Vera Cruz has been in operation for some years.

In addition to the five plants in operation, a refinery having a daily capacity of some 5,000 to 10,000 bbls. of crude petroleum is under construction at Mexico City and is expected to begin operations early in 1932.

The production of refined products in

(Continued on Page 106)

**TABLE 1—PETROLEUM REFINERIES IN SPECIFIED FOREIGN COUNTRIES, 1930-1931**

| Country— | Number of refineries: Operating | Shut down | Building | Total | Approximate total daily capacity of refineries (in barrels of 42 U. S. gallons): Operating | Shut down | Building | Total |
|---|---|---|---|---|---|---|---|---|
| In countries exporting refined petroleum products to the United States. | | | | | | | | |
| Mexico | 5 | 4 | 2 | 11 | 320,000 | 31,500 | 5,300 | 266,800 |
| Netherland W. I. | 3 | 0 | 0 | 3 | 297,000 | 0 | 0 | 297,000 |
| Trinidad | 5 | 0 | 0 | 5 | 35,700 | 0 | 0 | 35,700 |
| Venezuela | 7 | 0 | 0 | 7 | 25,115 | 0 | 0 | 25,115 |
| Total | 20 | 4 | 2 | 26 | 587,815 | 31,500 | 5,300 | 624,615 |
| In countries exporting only crude petroleum to the United States. | | | | | | | | |
| Colombia* | 1 | 0 | 0 | 1 | 7,000 | 0 | 0 | 7,000 |
| Ecuador | 3 | 0 | 0 | 3 | 850 | 0 | 0 | 850 |
| Peru | 2 | 0 | 0 | 2 | 17,000 | 0 | 0 | 17,000 |
| Total specified countries | 26 | 4 | 2 | 32 | 612,665 | 31,500 | 5,300 | 649,465 |

*Colombia exported 6 bbls. of kerosene to the United States in 1929; none in 1930.

**PETROLEUM REFINERIES IN SPECIFIED FOREIGN COUNTRIES, 1930-31**

| Country and company— | Main office— | Location of plant— | Approximate daily capac'y (bbls.) | Products— | Type of plant and equipment— |
|---|---|---|---|---|---|
| COLOMBIA: | | | | | |
| Tropical Oil Co. (International Pet. Co. of Canada, controlled by S. O. Co. of N. J.) | Cartagena | Barranca Bermeja | 7,000 | Gasoline, kerosene, fuel oil and lubricating oils. | Skimming and topping plants; mostly modern equipment. |
| ECUADOR: | | | | | |
| Anglo Ecuadorian Oilfields, Ltd. | London | La Libertad | 750 | Gasoline, kerosene, and fuel oil. | Modern equipment. |
| Ecuador Oilfields, Ltd. | London | Cautivo | 60 | Gasoline, kerosene, fuel and lubricating oils. | Equipment consists of three small stills of local manufacture. Reported that modern still of larger capacity is to be added. |
| Senora Micaelena de Lecaro Rubira | Carolina | Carolina | 40 | Gasoline, kerosene, and gas oil. | Refinery equipment not modern and not fully utilized. |
| MEXICO: | | | | | |
| Cia Mexicana de Petroleo, El Aguila S.A. (Royal Dutch-Shell) | Mexico City | Minatitlan | 20,000 | Complete line. | Complete plant with cracking equipment. Makes practically all the lubricating oil refined in Mexico. |
| Cia Mexicana de Petroleo, El Aguila S.A. (Royal Dutch-Shell) | Mexico City | Tampico | 90,000 | Complete line. | Complete plant, including the only asphalt plant in Mexico. |
| Cia Mexicana de Petroleo, El Aguila S.A. (Royal Dutch-Shell) | Mexico City | Tuxpam | 15,000 | Complete line. | Topping plant. |
| Cia Mexicana de Petroleo, El Aguila S.A. (Royal Dutch-Shell) | Mexico City | Mexico City | 5,000 | Under construction. | Reported that this plant is expected to begin operations early in 1932. |
| Cia Petrolera del Agwi S.A. | New York City | Tecomate | 10,000 | Shut down. | Topping plant. |
| Cia Petrolera y Refineria Eureka | | Tampico | 300 | Construction projected for producing petroleum products, asphalt, and petrol. paint. | Small refinery projected. |
| Continental Mexican Petroleum Co. (General Petroleum Co.) | Los Angeles, Calif. | Tampico | 20,000 | Shut down. | Topping plant. |
| Huasteca Petroleum Co. (Mexican Petroleum Co., a subsidiary of Pan American Petroleum & Transport Co.) | New York City | Tampico | 90,000 | Complete line. | Complete plant. |
| Pierce Petroleum Co. (Sinclair) | New York City | Tampico | 15,000 | | Complete. |
| Pierce Petroleum Co. (Sinclair) | New York City | Vera Cruz | 1,500 | Shut down. | Closed for five years. |
| Transcontinental Oil Co. (Standard Oil Co. of New Jersey) | New York City | Tampico | (*) | Shut down. | |
| NETHERLAND WEST INDIES: | | | | | |
| Arends Petroleum Co. (Royal Dutch-Shell) | The Hague, Holland | Bruif (on NW point island of Aruba) | 22,000 | Complete line. | New. |
| Lago Petroleum Co. (Pan American P. & T. Co.) | New York City | St. Nicholas, Aruba | 110,000 | Complete line. | Completely modern. |
| Curacaosche Pet. Ind. Mij. (Royal Dutch-Shell) | The Hague, Holland | Curacao | 165,000 | Complete line. | Largest petroleum refinery in the world. Equipped with new and modern cracking equipment. |
| PERU: | | | | | |
| International Petroleum Co. (of Canada) (Standard Oil Co. of N. J.) | Toronto, Canada | Talara | 16,000 | Complete line. | Skimming and cracking plant; modern cracking equipment. |
| Establecimiento de Petroles Zorritos | Zorritos | Zorritos | 1,000 | Gasoline, kerosene, gas oil and fuel oil. | Skimming and cracking plant; modern equipment. |
| TRINIDAD: | | | | | |
| Trinidad Central Oilfields, Ltd. | London | Tabiquite | 500 | Complete line. | Modern equipment. |
| Trinidad Lake Asphalt Co., Ltd. (General Asphalt Co.) | Philadelphia | Brighton | 1,200 | Gasoline for own use, road oil and binder for local sale. | Small topping plant. |
| Trinidad Leaseholds, Ltd. | London | Pointe-a-Pierre | 28,000 | Complete line. | Modern plant with cracking equipment. |
| United British Refineries, Ltd. | London | Point Fortin | 5,000 | Complete line. | Modern plant. |
| West India Oil Co. (Standard Oil Co. of N. J.) | New York City | Point d'Or | 1,000 | Complete line. | Skimming plant; modern equipment. |
| VENEZUELA: | | | | | |
| Caribbean Petroleum Co. (Royal Dutch-Shell) | Maracaibo | San Lorenzo | 17,000 | Gasoline, kerosene, gas oil, and fuel oil. | Skimming and cracking plant; modern equipment. |
| Compania Anonima Petrolea del Tachira | San Cristobal | Santa Ana Tachira | (*) | (*) | (*) |
| Lago Petroleum Co. (Pan American & T. Co.) | New York City | Salinas | 4,000 | Gasoline, kerosene, gas oil, and fuel oil. | New topping plant; supplies fuel oil to company's fleet of vessels as well as oil for local market. |
| Venezuela Gulf Oil Co. (Gulf Oil Corp.) | Pittsburgh, Pa. | Cabimas | 1,800 | | New topping plant; began operations early in 1929; entire production consumed by company. |
| West India Oil Co. (Standard Oil Co. of N. J.) | New York City | Maracaibo | 1,400 | Gasoline. | Topping plant at La Arriaga. |
| Colon Development Co. (Royal Dutch-Shell) | New York City | Tarva Field | 600 | | Topping plant; products used locally in company's operations. |
| Tucuyo Oilfields of Venezuela, Ltd. (Central Mining & Investment Co.) | London | El Mene de Acosta | 250 | | Topping plant; products used locally in company's operations. |
| British Controlled Oilfields, Ltd. | Montreal, Canada | El Mene | 65 | | Topping plant; products used locally in company's operations. |

Source: Based on list published in World Petroleum, July, 1931, and revised from data furnished by U. S. Bureau of Foreign and Domestic Commerce, and others.
*No data.

# Report of Tariff Commission on Oil

## Official Summary of Findings on Difference in Cost of Production and Refining Here and in Central and South America

WASHINGTON, D. C., Dec. 28.—The Tariff Commission has issued the following summary of its report to Congress on its investigation with respect to domestic and foreign costs of crude petroleum and refined products:

The present report is made to response to House Resolution No. 391 of March 3, 1931, which directs an investigation of the differences between the domestic and the foreign costs of production of crude petroleum, fuel oil, gasoline, and lubricating oils. The resolution directed that the foreign costs should be ascertained for countries which exported to the United States, during the two years 1929 and 1930 together, more than 2,000,000 bbls. in the aggregate of the crude and refined products specified.

In a previous investigation, made in accordance with Section 332 (f) of the tariff act of 1930, the commission ascertained the costs of production of domestic crude petroleum in comparison with petroleum from the Maracaibo Basin of Venezuela, during the years 1927, 1928 and 1929. The present investigation covers four years, 1927-1930, as regards crude oil, and it includes costs in Mexico, Colombia, Peru, Ecuador, and Trinidad, and in Venezuela, (including both the Maracaibo Basin and eastern Venezuela). The costs of production of refined petroleum products cover the years 1929 and 1930 and are shown for the products derived from domestic crude in comparison with the products derived from foreign crude by refineries in the United States and refineries in the principal foreign countries covered by the investigation, namely, Netherland West Indies, Mexico, Colombia, Peru, Venezuela and Trinidad (no refining costs were obtained for Ecuador).

Venezuela has been the principal source of imports of crude petroleum into the United States during recent years and the Netherland West Indies, where the refineries use Venezuelan crude oil, have been the principal source of imported refined products.

The Atlantic Coast States constitute the principal region in which foreign crude petroleum and refined products meet in competition with domestic. The costs, therefore, both domestic and foreign, include cost of transportation to the Atlantic Coast of the United States.

### Crude Petroleum

The Atlantic Coast area receives most of its supply of domestic crude oil from the Mid-Continent and Gulf oil fields, which include the states of Texas, Oklahoma, Arkansas, Kansas and Louisiana; relatively insignificant quantities are received from the Appalachian, Illinois and California oil fields. Costs of production were ascertained separately for each of the districts of the Mid-Continent and Gulf regions and these district costs, together with the costs in the Appalachian, Illinois, and California fields, were combined into a general average by weighting them according to the quantities which each district or region supplied to the Atlantic Coast.

The average cost of the domestic crude petroleum, weighted by the method stated, for the four years 1927-1930, including delivery to Atlantic Coast refineries, was $1.90 per barrel. The principal items in this total are $1.09 for costs of production at the well (including interest at 6 per cent on the investment of the companies and including depletion), a purchasing commission averaging 4 cents per barrel, pipe line charges principally from the wells in the Mid-Continent-Gulf regions to Gulf ports amounting to 40 cents per barrel, and tanker charges from Gulf ports to the Atlantic Seaboard averaging 26½ cents per barrel. Domestic costs have been compared first, with costs (a) for the Maracaibo basin, and (b) for all the foreign countries including the Maracaibo Basin.

(a) The average cost of production in the Maracaibo Basin of Venezuela, including local pipe line and lake transportation to the point of transfer to ocean tankers, for this same four-year period, was 62 cents per barrel; tanker charges to the Atlantic Seaboard of the United States averaged 25 cents, making a total delivered cost of 87 cents per barrel.

(b) The excess of domestic cost over the cost of the Maracaibo Basin oil, unadjusted for difference in yields from the two crudes, was thus $1.03 per barrel; the necessity of such adjustment is pointed out below.

(c) The cost of production of crude oil for all the foreign countries covered by the investigation (cost for each country, including the Maracaibo Basin in Venezuela, being combined into a general average by weighting according to its shipments to the United States), during the four-year period, averaged $1.15 per barrel delivered to the Atlantic Seaboard of the United States, of which 87 cents represented costs of production and local transportation, and 28 cents the ocean tanker charges. The domestic cost, without adjustment for yields, thus exceeded the foreign cost for all these countries combined by 75 cents per barrel.

### Delivered Cost

The delivered cost of the domestic crude petroleum consists, to the extent of more than one-fourth, of pipe line charges, the amout of which during the four-year period averaged 49 cents per barrel, whereas the corresponding item included in the foreign cost is much lower both absolutely and relatively to the total delivered cost. The figures for domestic pipe line transportation represent the rates charged by the pipe line companies and not their actual costs of operation. Most of the pipe lines are controlled, directly or indirectly, by concerns which are themselves producers or refiners of crude petroleum, and which in the aggregate produce a very substantial part of the domestic crude petroleum and refined products covered by the cost comparison. The commission was unable to make an investigation of the actual costs of operation of these pipe lines, but it calls attention to the fact that pipe line rates may materially differ from the actual transportation costs. On the other hand, Maracaibo crude petroleum, which is the dominant factor in the total foreign crude covered by the comparison, is moved only short distances by pipe line, that transportation which corresponds to trunk pipe line transportation in the United States being performed by shallow draft tank vessels on Lake Maracaibo. The cost given for Maracaibo crude includes only the actual costs of local pipe line and lake tanker transportation. To such extent, therefore, as the pipe line rates included in the domestic cost may differ from the actual cost of pipe line transportation, the difference between domestic and foreign costs are over or understated. The relative costs may also be affected, though to a much slighter degree, by the difference in the proportions of foreign and domestic crudes which move in company-owned as against chartered vessels.

### Interpreting Comparisons

In interpreting these comparisons between domestic and foreign costs, it is essential to take into account the fact that the domestic crude is on the average much superior in quality to the foreign crude; that is to say, it will produce more of the higher-priced finished products, especially gasoline and lubricating oils. With respect to gasoline this difference is principally due to the fact that the domestic crude is, on the average, lighter (of lower specific gravity), which means of higher Baume gravity test. The bulk of the output derived from foreign crude consists of fuel oils of relatively low unit value.

The commission has made an analysis of the relative values of the domestic and foreign crudes from this point of view. It ascertained the quantities of the several classes of refined products obtained from each and applied to these quantities identical unit prices per gallon. These calculations were made for 1929 and 1930 separately, but the data for 1930 are considered more representative.

It was found that in 1930 the gross value of the products derived from a barrel of domestic crude at Atlantic Coast refineries was $2.74, whereas the gross value of products derived from a barrel of crude by those domestic and foreign refineries which used Maracaibo petroleum exclusively or predominantly was $1.71. However, in order to obtain the more valuable products which they extract, the refineries using domestic crude must incur greater expense; their cost of refining in 1930 was 73 cents per barrel as against 30 cents for the plants using the foreign petroleum. Deducting the cost of refining, the net realization from the domestic crude was $2.01 per barrel as against $1.41 for the foreign article. Thus, on the basis of the experience of 1930, the foreign crude was worth only seven-tenths as much as the domestic; that is to say, seven-tenths of a barrel of domestic would produce as great a value of finished products as a full barrel of the foreign petroleum. This ratio, moreover, probably somewhat overstates the relative value of the foreign crude oil, since the quality of the gas and fuel oils obtained from the foreign crude, is, on the average, not so high as that of such oils derived from domestic petroleum, and therefore they do not, as an aggregate, possess the same unit values, as is assumed in the method of analysis used.

### Average Production Cost

Since the average cost of production of domestic petroleum, including transportation to the Atlantic Coast refineries, during the four-year period 1927-1930 was $1.90 per barrel, the cost of seven-tenths of a barrel would be $1.33 as compared with 87 cents, the cost of 1 bbl. of Maracaibo crude during the same period, an excess of 46 cents per barrel, this being an overstatement to whatever extent the products of foreign crude may be overvalued.

It should be noted that any such adjustment between domestic and foreign costs on the basis of the yields and prices of the several products obtained and the cost of refining is subject to variation from year to year. Constant changes are being made in the methods of refining with consequent changes in the proportions of the several finished products extracted from the crude. The relations between the prices of the several finished products are variable. The relation between the domestic and foreign costs of refining may also change. Unquestionably, however, at all times in the past the domestic crude has been of higher average grade than the Maracaibo product.

### Analysis of Yields

A similar analysis of the yields obtained from all the kinds of foreign crude petroleum covered by the investigation shows for 1930 substantially the same net value of products as was obtained from Maracaibo crude alone, the figure being $1.42 per barrel. On the other hand the average cost of production of all this crude petroleum was much higher than that of the Maracaibo crude, amounting for the four-year period to $1.15 per barrel. The cost of seven-tenths (70.6 per cent) of 1 bbl. of domestic crude from which can be derived, according to the experience of 1930, finished products of the same value as from a full barrel of foreign crude, being $1.34, the excess of the domestic cost over the foreign cost for crude from all the competing countries taken together is found to be 19 cents per barrel.

It should be noted, further, that in calculating the costs the rate of interest on capital has been taken on the same basis for both the United States and the foreign countries, namely 6 per cent. The attention of the commission has been called to the question of the relative stability of investment in the United States and the foreign areas covered in this investigation, and also to the question of the relative depreciation of perishable equipment in tropical as compared with temperate areas. These matters are further discussed in the body of the report. The commission has been unable to determine how much, if any, difference in rates of interest and depreciation should be made.

### Refined Petroleum Products

The resolution of Congress directed a comparison of domestic and foreign costs of gasoline, fuel oil, and lubricating oils. It did not mention kerosene, but the

(Continued on Page 106)

## ACTIVE IN TEXAS PETROLEUM AFFAIRS

Members of the executive committee of the Texas Oil and Gas Conservation Association. In the back row, left to right: Charles F. Roeser of Fort Worth, president; W. L. Todd of Dallas, J. R. Pearson of Tyler, Roy B. Jones of Wichita Falls. Front row, left to right: Clifford Mooers of Longview, George Sawtelle of Houston, E. L. Smith of Mexia and Col. J. Lewis Thompson of Kilgore.

# Internal Combustion Engine Detonation

## Gas Pressures, Velocity of Flame, Process of Burning and Other Factors Explained in Discussion of Phenomenon

By Arthur Seymon Martin

The author submits herewith a discussion upon his studies of the detonation phenomenon as encountered in internal combustion engines in the belief that any additional light which might be disclosed upon this highly debated subject may be of material assistance in further improving the design of combustion chambers and may lead to new methods of meeting the problems associated with the refining of superior gasolines.

It is definitely known that, within measurable limits, the rate of burning (or speed of the combustion wave) within the combustion chamber of a motor increases with increases in pressure and/or temperature of the hydrocarbon fuel mixture, other conditions being equal. It is reasonably safe to assume that this increase in rate of propagation of the flame continues beyond measurable limits. Indicator diagrams made from the most delicately registering instruments even suggest the possibility of an increase in the rate of increase itself, although other factors may intercede to introduce an error in interpretation at this point.

### Gas Pressures

A simple and familiar law of physics explains the action which at all times causes every portion of a gas confined within a closed chamber to possess the tendency for maintaining exactly equal and uniform pressures. When a hydrocarbon fuel mixture burns it increases many fold in pressure or volume, or both. During the progress of combustion in such a gaseous mixture confined within a closed space, where one portion is converted into burned gas while some of the remainder continues to exist in its unburned state for a minute interval of time, considerable redistribution of the gaseous mass must take place in order that this uniformity of pressures be maintained. An analyzation of the process discloses that, as the combustion wave progresses, there must be expansion of the burned gases immediately behind the flame front, and compression of the unburned portion in advance of the flame, in the maintenance of this equalization of pressures throughout the mass. This is ordinarily a simple movement within the gaseous mixture, but where a detonation develops, the redistribution of pressures acquires considerable complexity. During the last stages of normal burning (as distinguished from what occurs during a detonation), when combustion attains a high velocity, under the conditions of greater pressures and temperatures, this redistribution of the gases must also take place proportionately more rapidly in order to maintain the substantial uniformity in pressures. If the velocity of the flame should become sufficiently high, it is obvious that gas might burn at a rate completely exceeding the redistribution process. A concentration, or localization, of pressure within the immediate vicinity of the flame would then result. The flame would travel directly into the unburned gas of such concentrated or abnormal pressure, and this condition augments its velocity even to a greater speed. Progressively, the flame, in such a manner, will develop into a velocity which may border upon the infinite, relatively, and extremely high localized pressures would be produced. It would then be said that a detonation had taken place.

In the process of producing the detonation described it has been assumed that the initial pressure and temperature of the hydrocarbon fuel mixture was sufficiently high to produce such a result for the fuel employed. The possibility that the last portion of the combustion process may develop into a detonation depends upon both of these conditions, and also others to a lesser degree.

### Localization of Pressure

It may be noted, that, according to the foregoing explanation of the detonation phenomenon, a localization of pressure within the immediate vicinity of the flame wave is the direct cause which brings about a highly abnormal rate of burning, and its attendant results, the combination of which is termed a detonation. Whenever pressure once "piles up" in the immediate vicinity of the flame (combustion wave) things literally begin happening. Thus, while detonation in turn produces intense localizations of pressure, there first must be some substantial localization of pressure within the immediate area of the flame in order for detonation to develop. Some such localization always precedes the detonation, under such reasoning. Then one might state that a detonation is caused by a localization or "piling-up" of pressure.

Were it not for the physical facts of mass and inertia, detonation of the present type would never take place in an internal combustion engine. If there could be a fuel mixture which were completely devoid of mass, there would be perfect redistribution of pressure under all conditions. No localization of pressure could ever exist therein. The detonation process could not even start. However, with mass present, conditions are produced which cause the fuel mixture to attain a rate of burning where the inertia of the gas will impede redistribution sufficiently to bring about substantial "piling up." When the flame reaches exceedingly high velocities, the gaseous masses refuse to move with sufficient acceleration of speed to permit of perfect redistribution, and localizations form. Then, a detonation is the result.

### Process of Burning

A summary of the process described would be: An explanation of the detonation phenomenon is that, during the progressive process of burning in the hydrocarbon fuel mixture, whenever speed of propagation of combustion wave attains a velocity whereby the combustion process creates local higher pressures in its immediate vicinity substantially more rapidly than the rate at which the inertia of the gaseous matter permits redistribution to proceed, then, a detonation is likely to develop, wherein the remaining portion of the fuel burns under a condition of abnormally high pressures.

The accompanying drawings may afford a clearer conception of the detonation process than the foregoing description. The diagram of Figure 1 represents a longitudinal section through an elongated combustion chamber, chosen herewith for describing a hypothetical case. The arbitrary division lines shown divide the fuel charge into eight equal portions, represented by 1, 2, 3, etc. Assume that the gaseous mixture has been compressed to 250 pounds per square inch prior to its ignition by a spark plug (not shown) located at the extreme left end of the combustion chamber. Although this would constitute an exceptionally high initial compression, it has been selected at random owing to certain advantages a higher compression possesses for illustrating the process described. The principle to be clarified is identical to that which would be involved under detonation within a fuel of lower initial compression pressure. Assume that combustion raises the temperature of the gas sufficiently in all cases to increase its pressure to exactly four times the original, under constant volume. Although such a figure would neither be constant through the mixture nor correct in actual operation of an internal combustion engine, the principle to be illustrated, again, will not be altered thereby. The minor effects of adiabatic heat, and other unimportant factors, may be ignored in the purpose at hand.

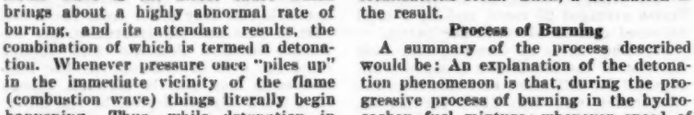


Fig. 1.

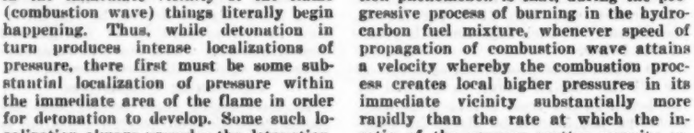


Fig. 2.

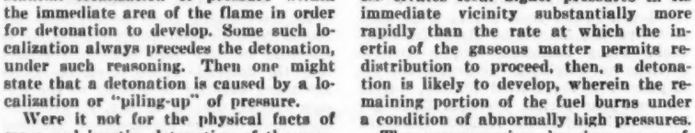


Fig. 3.

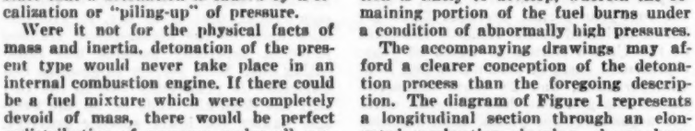


Fig. 4.

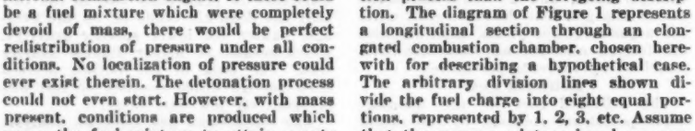


Fig. 5.

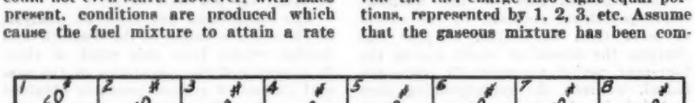


Fig. 6.

When the fuel mixture is fired that portion surrounding the spark plug is the first to burn. As soon as the flame completes its journey through portion 1 that part of the charge will have expanded somewhat as represented in Figure 2, and in so doing will have compressed each of the remaining seven unburned portions to approximately 344 pounds per square inch pressure. Upon traversing portion No. 2 this combustion will cause the eight parts to occupy positions similar to those displayed in Figure 3, and will raise the pressure of the entire charge to approximately 437 pounds. If the fuel employed would not burn with sufficient rapidity below 531 pounds pressure, under the conditions encountered in the combustion chamber illustrated, to bring about any substantial localization of pressure, portion No. 3 would not cause any detonation during its combustion, and would relocate the eight parts similar to the positions portrayed in Figure 4 of the drawings. It may be noted at this point that the unburned fuel is rapidly being concentrated in that part of the chamber most remote from the spark plug.

Instead of selecting a fuel which would not localize pressures below a condition of 531 pounds/square inch, one of more inferior antiknock quality might be employed which would burn so fast under a condition of 450 pounds/square inch or higher, within the combustion chamber illustrated, that the redistribution of pressures would be left far behind under such circumstances. Then, when portion No. 3 finished burning it might occupy a position more like that shown in Figure 5, without having completed its full quota of expansion, as it would not have had sufficient time for that. The next remaining unburned portion No. 4 will be compressed more than its proportionate share, while all portions at a distance on either side of No. 3 will not have received their full quotas of compression. Insufficient time will have elapsed for them to have received the entire effect due. Pressures will be concentrated within the burning portion and its immediate vicinity, while the more removed portions will be at pressures below normal. The values in each of the respective parts when portion No. 3 completes its combustion process will probably be approximated by the estimates given in Figure 5.

### Increasing Pressures

When portion 4 begins burning, the flame will dash through this parcel at higher speeds than ever, owing to the much greater pressure existing within it, compared with what portion No. 3 had at the time combustion entered that part. Less time will be available for distribu-

(Continued on Page 92)

# Edwards Plateau Area Has Possibilities

## Plentiful Thickness of Pennsylvanian Formation in Large Section of Southwest Texas Attracts Attention

By B. D. Stevenson

SAN ANTONIO, Tex., Dec. 28.—Around 60 tests for oil or gas have been drilled in eight counties in the Edwards Plateau region, a territory of over 15,000 square miles or about one test to 250 square miles, and with little or no connected geology between them, but seemingly proving the existence of numerous big structures and definitely proving the existence of a plentiful thickness of Pennsylvanian formation. Also many of the tests have had very important showings of oil and gas, proving that there are accumulations in the area.

This territory, which represents an area of about one-fifth the size of the state of Oklahoma, was rarely invaded by the wildcatter till recent years, but in the search for oil in the years to come seems definitely sure to attract a wide attention.

The area is bounded on the south by the Balcones Fault, on the east by the Llano uplift, on the west by the Marathon fold and on the north by the Colorado River and the lower end of the North Texas producing fields. The area roughly is about 125 miles square.

Near the Llano uplift Ellenberger and granite are encountered at shallow depths, but to the west and south there is ample thickness of formations that can pay off. The eastern half of Menard, Kimble, Kerr and all of Gillespie Counties are included in the territory where granite or Ellenberger are naturally expected at shallow depth due to the Llano uplift. Farther removed from the uplift the Pennsylvanian is encountered on the average at less than 1,500 feet and the Magnolia's No. 2 Whitehead at 6,725 feet and the Phillips Petroleum Co.'s No. 2 Holman at 8,230 feet in northwestern Edwards County did not get through the Pennsylvanian.

### Acreage in Large Blocks

Interesting features about this area are that some of the sands encountered in the Pennsylvanian have shown a thickness of over 200 feet. It is an area with many surface structures and many of the structures of large extent. Over much of the area land ownership is in big blocks of big ranches and big blocks of acreage can be obtained at relatively low cost. It is a cable tool country and costs of drilling will about average with costs in West Texas under similar conditions.

Roads throughout the district are quite good, better, it is said, on the average, than in West Texas.

Distance to deep water market on the Gulf is about the same as from East Texas to the Gulf and The Texas Company and Shell each has a pipe line running through the district and Humble and Illinois have lines running across the south border of the district.

There was one diamond core test drilled in the district. It was the National Potash Co.'s No. 1 Ross, located a little southeast of the corner of Sutton County, and it stopped in the Pennsylvanian at 1,406 feet, topping it some higher than that. Other than this core drilling and geophysical work, so far as can be learned, has been entirely absent. Also of the early drilling in the country in many cases very poor records were kept. But of the 60 tests listed in the territory 20 have gone to 4,000 feet or below and with one or two possible exceptions have stopped in the Pennsylvanian without going through it. Sixteen others have gone below 3,000 feet and, with the exception of one that was near the Llano uplift, they all stopped in Pennsylvanian.

There is a possibility that the surface structures do not conform to the subsurface but for the most part the tests so far drilled have been with reference to an available block rather than with reference to geology, but there are notable cases over the district of very important showings of oil and gas. The top of the Ellenberger, and presumably the limit of drilling, is pretty well established across the eastern border of the district, but to the west through Schleicher, Sutton and Edwards and the eastern portion of Crockett and Val Verde there is no authentic record available of any test having gone through the Pennsylvanian though eight tests went below 5,000 feet, four of them below 6,000 feet and Phillips' No. 2 Holman to 8,230 feet.

### Showings in Deep Tests

Of these deeper tests several have had important showings. On the south edge of Sutton County Phillips Petroleum Co. drilled the No. 1 Holman to 6,635 feet stopping in the Pennsylvanian and had about 1,500,000 feet of gas, and the No. 2 Holman was drilled immediately south of it and over the line in Edwards County going to 8,230 feet. It had about half a million feet of gas in sand at 6,672-73 feet.

In 1929, the E. H. R. Green drilled some wells in the west center part of Edwards County near the Val Verde County line. One test was said to be on the line. Two shallow tests had some thick heavy oil at shallow depth and one test is said to have gone to around 3,500 feet and got a showing of oil that shot over the derrick but later failed to make a well. The test was on the Whitehead ranch. In recent times Magnolia Petroleum Co. acquired the lease and drilled two tests. The No. 1 Whitehead was over the line in Val Verde County, west of the E. H. R. Green test, and went to 6,725 feet, and the No. 2 drilled in Edwards County a little north of the Green tests, went to 3,502 feet to test for the shallower showing, but failed to make a well.

Devil's River Oil Co. drilled No. 1 Turney, about 5 miles south of the Phillips Petroleum Co.'s No. 2 Holman and got two or three barrels of oil at 440 feet, with total depth 2,720 feet, and about 8 miles farther southeast and about 10 miles northeast of the Magnolia tests drilled No. 2 Turney and got a little showing of oil at around 400 feet.

In the eastern part of Edwards County, Transcontinental Oil Co.'s No. 1 Peterson, drilled several years ago, reached a total depth of 3,962 feet and at a little below 3,900 feet it showed a lot of gas, probably half a million feet. In 1926 X. K. Stout drilled two tests south of it and had some important showings; and in 1930 James Dalglish drilled a test east of it to 5,206 feet and it also had considerable gas at 3,905-50 feet. The four tests were drilled within a mile or so of each other.

There are reports that scattered over Edwards County and the whole Edwards Plateau numerous ranch water wells are spoiled by oil.

### Kerr and Real Counties

Within the last year considerable attention was attracted to the area by the Evans & Gant activity in western Kerr and eastern Real County. No. 1 Love, in western Kerr County, the first test they drilled, found enough sand in the Pennsylvanian at 2,552 feet and again at 3,391 feet to make small wells. No. 2 Love, last reported at 4,800 feet, was in the Pennsylvanian, which was topped at about 1,400 feet. Five tests in that area have gone to below 4,000 feet without going through the Pennsylvanian, and all of them have found an abundance of sand, in one instance a thickness of 200 feet. They seem to be somewhat off structure, but with some showings of oil and gas, and a test on structure with that amount of sand should make a big producer.

One of the first tests to attract attention to the Edwards Plateau was the Wood-Texas' No. 1 Clayton in western Bandera County, which had enough oil in the lower horizon to flow over the top of the casing for one head and created a great deal of excitement for a time. This well started in the lower Cretaceous and probably got the Pennsylvanian at about 930 feet. One oil found at 2,627 feet was 26 gravity. The oil encountered in the Evans & Gant's No. 1 Love in western Kerr County at 3,351 feet was about 40 gravity.

About 5 miles or so south and a little east of the Wood-Texas well the Humble Oil & Refining Co. drilled No. 1 Thompson, encountering the Pennsylvanian probably at 890 feet, and it drilled to 3,670 feet without getting any showings.

Evans & Gant's No. 2 Love had several good showings of oil and gas. At 1,985 feet it had about half a million feet of gas and at 3,673-83 feet, and again at 3,750-63 feet, had sands that were good for about 1,000,000 feet of gas, the lower sand carrying a strong odor of gasoline.

Across the southern part of the territory under discussion R. P. Sterling's No. 1 Willie Werner in approximately the center of the county, topped the Ellenberger at about 920 feet. Half way across the county to the west the Walker-Van Duyn's No. 1 Leigh, in eastern Kerr County, topped the Ellenberger at 2,835 feet. Half way across Kerr County, to the west, the A.C.P. test topped Ellenberger at 4,665 feet, and from that on west no one has reached the Ellenberger.

Farther north in Kimble County the Transcontinental's No. 1 Beasley, sometimes designated the Delvatex's No. 1 Beasley, topped the Ellenberger at 2,570 feet, and farther west the Dixie Oil Co. topped it at 2,925 feet. Near the western county line Transcontinental's or Delvatex's, No. 1 Patterson topped it at 3,970 feet, and north and west Independent's No. 1 Allison topped it at 4,235 feet. From that point west no one is reported to have reached it and few tests drilled deep enough except in the southern part of the county and northern part of Edwards County, where Phillips went to 8,230 feet.

In Menard County records seem to indicate tests drilled have never gone very

(Continued on Page 108)

**Bandera County**

| Company and well— | Elev. | Top Penn | Top Elbgr. | Total depth |
|---|---|---|---|---|
| Wood-Texas' No. 1 Clayton (bottomed in Penn) | 1,611 | 930 | .... | 4,020 |
| Humble's No. 1 Thompson (bottomed in Penn) | 1,502 | 890 | .... | 3,670 |
| Hicks' No. 1 Arnold | .... | .... | .... | 700 |
| Graham's No. 1 Roberts | .... | .... | .... | 300 |
| R. J. McCurdy's No. 1 Jose Rivas (bot'd in lower Comanche) | .... | .... | .... | 300 |

**Edwards County**

| | | | | |
|---|---|---|---|---|
| Devil's River's No. 1 Turney | .... | .... | .... | 2,720 |
| Devil's River's No. 2 Turney | .... | .... | .... | 1,104 |
| Phillips Petroleum's No. 2 Holman | .... | .... | .... | 8,230 |
| James Dalglish's No. 1 Peterson | .... | .... | 4,225? | 5,206 |
| Transcontinental's No. 1 Peterson (bottomed in Penn gas) | 2,360 | 1,140 | .... | 3,962 |
| X. K. Stout's No. 1 Peterson | .... | .... | .... | 2,850 |
| X. K. Stout's No. 2 Peterson (bottomed in Smithwick) | .... | .... | .... | 4,600 |
| McMan O. & G. Co.'s No. 1 Schreiner | 1,896 | .... | .... | 3,897 |
| Magnolia's No. 2 Whitehead | 1,896 | .... | .... | 3,502 |
| Griffith's No. 1 Wardlaw | .... | .... | .... | 3,000 |
| Empire Gas & Fuel's No. 1 Rust | 1,815 | 1,012 | .... | 3,635 |
| Gail Oil Co.'s No. 1 Jergin | 1,775 | .... | .... | 4,110 |
| Russell Oil Co.'s No. 1 Jackson (bottomed in Penn) | .... | 945 | .... | 2,720 |

**Kerr County**

| | | | | |
|---|---|---|---|---|
| Evans & Gant's No. 1 Love | 2,305 | 1,380 | .... | 4,060 |
| Evans & Gant's No. 2 Love | 2,380 | .... | .... | Drlg. |
| Evans & Gant's No. 1 Selker-Mears (bottomed in Penn) | 2,237 | 1,325 | .... | 4,031 |
| Evans & Gant's No. 1 Young | .... | .... | .... | Drlg. |
| A.C.P.'s No. 1 School Land | 2,335 | .... | 4,665 | 4,715 |
| Walker-Van Duyn's No. 1 Barfield | .... | .... | .... | 2,100 |
| Walker-Van Duyn's No. 1 Leigh | .... | .. | 2,835 | 3,000 |
| Schreiner's No. 1 fee (water well, bottomed in Granite at 1,250 feet) | .... | .... | .... | .... |

**Kimble County**

| | | | | |
|---|---|---|---|---|
| Transcontinental's No. 1 Beasley | 2,100? | .... | 2,570 | 2,670 |
| Transcontinental's No. 1 Paterson | 2,140 | .... | 3,970 | 3,980 |
| Brazos-Menard's No. 1 Mears (bot'd in Granite at 3,295 feet) | 2,110 | .... | 3,708? | 3,340 |
| Dixie Oil Co.'s No. 1 E. O. Bole | 1,902 | .... | 2,925 | 3,026 |
| Home Oil & R. Co.'s No. 1 Fisher | 1,728 | .... | .... | 635 |
| Thomas & Ludlow's No. 1 Russell | .... | .... | .... | 1,055 |
| McLean & Jamison's No. 1 Cameron | 1,728 | .... | .... | 1,650 |
| C. L. Bryan's No. 1 Lambert | .... | .... | .... | 800 |

**Menard County**

| | | | | |
|---|---|---|---|---|
| J. C. Barnett's No. 1 Callan City | .... | .... | .... | 1,268 |
| J. C. Barnett's No. 3 Callan City | .... | .... | .... | 1,943 |
| J. C. Barnett's No. 4 Callan City | .... | .... | .... | 1,200 |
| Panhandle Ref. Co.'s No. 1 Eckhart | .... | .... | .... | 3,200 |
| Cromwell & Duffey's No. 2 Winslow | .... | .... | .... | 1,140 |
| Priest & Duffy's No. 1 Sorrell | .... | .... | .... | 2,860 |
| Voss & Bryan's No. 1 Bredenberger | .... | .... | .... | 800 |

**Real County**

| | | | | |
|---|---|---|---|---|
| Evans & Gant's No. 1 Haby | 2,218 | .... | .... | Drlg. |
| Evans & Gant's No. 1 A. D. Auld (bottomed in Penn) | 2,361 | 1,495 | .... | 4,007 |
| Evans & Sprinkle's No. 1 A. M. Auld (bottomed in Penn) | 2,273 | 1,350 | .... | 4,185 |

**Schleicher County**

| | | | | |
|---|---|---|---|---|
| Texas & Gant's No. 1 Allison | .... | .... | .... | 5,080 |
| Indian Territory's No. 1 O'Harrow | 2,421 | .... | .... | 5,745 |
| Paragon Oil Co.'s No. 1 Boyd | 2,265 | .... | .... | 3,778 |
| Gray Robinson's No. ——— | 2,374 | .... | .... | 3,507 |
| Cope & Dalton's No. 1 Meyer | 2,570 | .... | .... | 3,640 |
| Duffey-Fort McKavitt's No. 1 Tisdale | 2,151 | .... | .... | 3,500 |
| Phillips-Interstate's No. 1 Whitten | 2,333 | 665 | .... | 6,880 |
| George Wilson's No. 1 Bert Page | .... | .... | .... | 5,052 |

**Sutton County**

| | | | | |
|---|---|---|---|---|
| Independent's No. 1 Allison | 2,291 | .... | 4,235 | 4,315 |
| Chesapeake's No. 1 Allison | 2,541 | .... | .... | 3,520 |
| So. Crude Oil P. Co.'s No. 1 Allison | 2,373 | .... | .... | 4,950 |
| Phillips Pet. Co.'s No. 1 Holman | 2,247 | 3,485 | .... | 6,635 |
| Phillips Pet. Co.'s No. 1 Cauthorn | .... | .... | .... | 975 |
| Phillips Pet. Co.'s No. 1 Cusenberry | .... | .... | .... | 1,035 |
| National Potash's No. 1 Ross | .... | .... | .... | 1,406 |
| Priest's No. 1 Allison | 2,338 | .... | .... | 4,017 |

**Val Verde County**

| | | | | |
|---|---|---|---|---|
| Magnolia's No. 1 Whitehead | 1,770 | .... | .... | 6,725 |

# Favorable Production Outlook in 1932

## Oklahoma Has Already Put Its House in Order, Kansas Is in Line and Much Help Is Expected From Texas

By James McIntyre

As The Oil and Gas Journal predicted last week, the Oklahoma Corporation Commission issued an order limiting crude oil production in Oklahoma to demand, which the commission found was 475,000 bbls. per day as an average for January, February and March, 1932. The order was made effective for the three months' period named. This will cut Oklahoma City production to an average of 160,000 bbls. per day; the Greater Seminole-St. Louis area to 135,000 bbls. Class C pools, including West Chandler, West Seminole, Fish, Orlando, West Perry, Township 20n-4w, Tatums and Wewoka townsite to 19,875 bbls. and the remainder of the State to 160,125 bbls. The work of reducing production within the limits named will be under the direction of the state and field umpires in the Oklahoma City, Greater Seminole and Class C areas, while in the older settled fields, known sometimes as the stripper fields, the responsibility is placed in the hands of the pipe line companies, which are expected to cut their runs in the miscellaneous areas sufficient to keep the production within the limits named.

### Working Out the Details

It was ordered that Oklahoma City wells need not take new potentials until April 1, 1932, and that the potentials taken in October, 1931, shall in the meantime remain in force. Effective January 1, each producing well in the Oklahoma City Field outside the Silicious lime area, which is making 3 per cent or more of water shall be permitted to produce 100 bbls. per day, in addition to the amount otherwise provided for. All pools in the State heretofore designated as Class A pools shall be restricted to 90 per cent of the quantity allowed under the last previous order, for example a lease having an allowable of 180 bbls. per day shall be reduced to 162 bbls. per day. Pipe line and purchasing companies are directed to enforce this additional restriction. The pools designated as Class A include all the pools in the stripper class.

Leases in the Class B pools shall be limited to 44 per cent of their potential, provided, however, that leases in the Maud Pool and leases in any other pools not capable of making in excess of 50 bbls. per day per lease shall be allowed an exemption of 20 bbls. per well per day and the curtailment of 44 per cent shall be applied to the excess over an average of 20 bbls. per day per well. Class B pools include Allen (Wilcox and Cromwell sands), Bowlegs, Earlsboro, Earlsboro townsite, Little River, East Little River, Marshall-Lovell, Maud, Mission, Sasakwa, Searight, Seminole, East Seminole and St. Louis.

The Chandler Pool in Lincoln County was limited to 3,675 bbls.; Fish Pool in Seminole and Hughes Counties (Township 7-8), 1,500 bbls.; Orlando Pool, Payne County, 500 bbls.; West Perry, Noble County, 800 bbls.; Township 20-4w, Garfield County, 300 bbls.; Tatums, Carter County, 5,400 bbls.; Wewoka townsite, Seminole County, 5,000 bbls.; and West Seminole, Seminole County, 2,700 bbls. In each of the pools named the proration shall be on a lease basis. All wells in the Oklahoma City Pool that are illegally overproduced shall remain shut in until the overproduction is made up.

### The Oklahoma City Field

In handling the Oklahoma City Field the orders provide that the Silicious lime area as a whole shall be allotted an allowable production of 7,000 bbls. per day, the allowable to be apportioned among the operators of wells in the area in

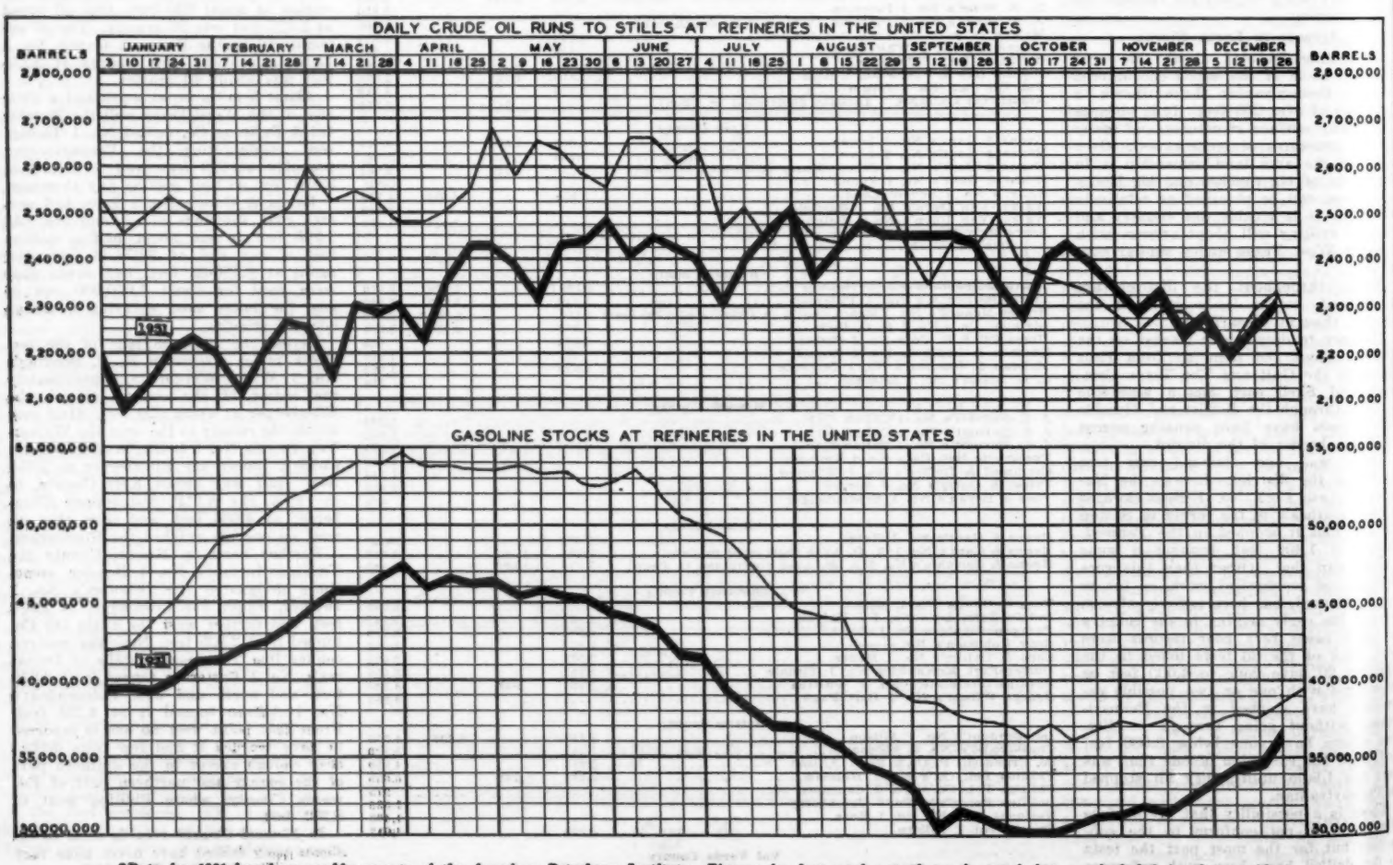
(Continued on Page 107)

## AMERICAN PETROLEUM INSTITUTE WEEKLY REFINERY STATISTICS

The weekly report made to the American Petroleum Institute on refinery statistics—crude runs to still, gasoline stocks and gas and fuel oil stocks in barrels—for the week ending December 26:

| | Week ending December 26, 1931 | | | | Week ending December 19, 1931 | | | | Week ending December 27, 1930 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) |
| East Coast | 100.0 | 453,100 | 4,480,000 | 7,912,000 | 100.0 | 453,000 | 4,293,000 | 9,209,000 | 100.0 | 458,000 | 5,780,000 | 9,957,000 |
| Appalachian | 91.8 | 88,300 | 1,330,000 | 1,601,000 | 91.8 | 97,600 | 1,292,000 | 1,679,000 | 93.4 | 77,600 | 1,005,000 | 1,044,000 |
| Indiana, Illinois, Kentucky | 98.9 | 238,400 | 4,181,000 | 5,577,000 | 98.9 | 305,300 | 3,972,000 | 5,528,000 | 91 9 | 242,400 | 4,489,000 | 3,547,000 |
| Oklahoma, Kansas, Missouri | 89.6 | 203,200 | 3,505,000 | 4,365,000 | 89.6 | 237,600 | 3,324,000 | 4,305,000 | 98.3 | 227,700 | 2,808,000 | 4,293,000 |
| Texas | 91.3 | 562,400 | 7,573,000 | 11,873,000 | 91.3 | 564,300 | 7,463,000 | 11,848,000 | 93.1 | 484,700 | 6,813,000 | 10,760,000 |
| Louisiana and Arkansas | 98.0 | 174,900 | 1,262,000 | 4,070,000 | 98.9 | 173,800 | 1,185,000 | 4,030,000 | 98.8 | 144,900 | 1,514,000 | 2,303,000 |
| Rocky Mountain | 89.4 | 35,600 | 1,665,000 | 750,000 | 89.4 | 40,300 | 1,566,000 | 800,000 | 93.1 | 39,300 | 1,642,000 | 996,000 |
| California | 97.1 | 432,100 | 13,203,000 | 96,393,000 | 97.1 | 445,400 | 12,841,000 | 96,509,000 | 98.8 | 532,800 | 15,337,000 | 104,017,000 |
| Total United States | 95.2 | 2,238,000 | 37,199,000 | 132,541,000 | 95.2 | 2,317,300 | 35,936,000 | 133,908,000 | 95.7 | 2,207,400 | 39,388,000 | 136,917,000 |
| Texas Gulf Coast | 99.8 | 447,900 | 5,784,000 | 8,845,000 | 99.8 | 433,600 | 5,756,000 | 8,787,000 | 100.0 | 366,700 | 5,379,000 | 8,064,000 |
| Louisiana Gulf Coast | 100.0 | 116,700 | 1,100,000 | 3,168,000 | 100.0 | 117,100 | 1,043,000 | 3,239,000 | 100.0 | 99,300 | 1,253,000 | 1,356,000 |

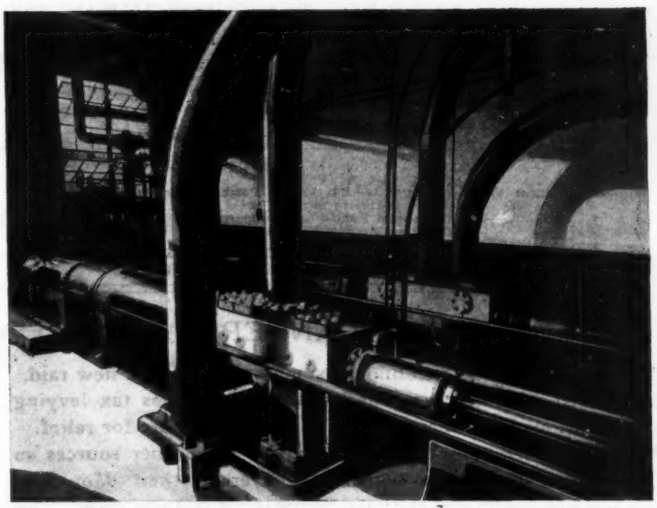
(1) Per cent refinery capacity represented. (2) Daily crude runs to stills. (3) Gasoline stocks. (4) Gas and fuel oil stocks.




*Data for 1931 based on weekly reports of the American Petroleum Institute. Figures for last week not shown in graph but are included in above tables.*

# Right

THIS TRANSIT Crank and Fly wheel Hot Oil Pump is especially adapted for hot oil work because of its dependability, ease and simplicity of operation and control. On this type of pump, the throws on the crankshaft are 90° apart. When one plunger is nearing the end of its stroke (and thereafter traveling very slowly) the plunger on the opposite side is at the center of its stroke and traveling at its highest speed. Thus, both the speed and pressure of the oil in the common discharge line are kept very constant. The positive filling of the fluid cylinders and the relatively long stroke lessens shocks and vibration both in the pump and the whole system, thus lengthening the life of the entire unit.



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## A NEW DANGER

The oil industry and gasoline consumers are facing a new raid.

Confronted with decreased or inadequate revenues tax levying powers in various States are turning to the gasoline tax for relief.

They have piled the burden of taxation from other sources so high that they dare not overload the taxpayers further. Mounting deficits weaken credit and threaten bankruptcy in some cases. The indifference with which the public has tolerated the increasing tax on gasoline and the ease in collection offers legislatures the hope of speedy relief without popular revolt.

Tennessee has just increased its gasoline levy to seven cents a gallon not to build or maintain good roads but to take care of general expenses. The District of Columbia is considering doubling its two cents a gallon rate for municipal purposes.

Five legislatures meet in 1932, four of them in the South where gasoline taxation has been highest.

States have taxed many things but no source ever tapped has yielded so quickly and so increasingly such a flood of revenue as the tax on gasoline. Even the tax on motor vehicles has lagged far behind the receipts from the tax on the fuel that moves them.

In ten years the returns from gasoline taxation have increased over 10,000 per cent. In many states the yield from that tax in one year has exceeded the entire state revenue only a few years back.

Small wonder, then, that harried legislators and state officials facing a deficit and fearing to increase other taxation lest the taxpayers rebel, seize upon the gasoline tax as a political life saver.

They have seen that tax increased from one cent a gallon to two, then to three, four, five, six and even to seven cents a gallon without provoking popular resentment. The comparatively small proportion of motorists in the country when the first gasoline tax was levied welcomed the promise of improved highways. That was the only excuse there ever was or can be for levying a special tax on motorists using the public roads.

But the ease with which the tax was levied and collected and increased soon outran the legitimate needs of existing highway departments in many states and the surplus was turned over to other purposes with the suave explanation that it would keep down the general tax rate.

From that to outright appropriation for quite other uses of the special fund contributed by motorists for public highways alone was a natural sequence, politicians being what they are.

And, as has been pointed out, we can now look forward to a widespread increase and diversion of gasoline taxation wherever near bankrupt states find themselves needing money.

We already have had the example of Pennsylvania putting on for a certain period an additional cent of tax to take care of certain state needs. We have had Oklahoma adding a cent for a year on a plea of unemployment relief, with less revenue actually being collected under the increased rate.

An attempt to duplicate that scheme had just been defeated in the Pennsylvania legislature. The governor had demanded an increase from three to five cents for two years.

But for the first time in any state the oil companies and the motoring public united in an effective campaign of opposition, showing there was a limit beyond which increased rates would diminish returns and exposing the evils and losses that result from ignoring the fact that it is impossible to collect such a tax whenever it becomes so high that it is resented by the public or offers an attractive premium on evasion.

The American Automobile Association and the Pennsylvania Motor Federation were aroused and enlisted in active and energetic protest which reached the newspapers, the legislators and the stockholders of oil companies.

The Pennsylvania Motor Truck Association pointed out that commercial vehicles consumed about half the gasoline used annually in Pennsylvania which would mean that under a 5 cent tax they would be taxed about $28,500,000 a year, wiping out the earnings of a large share of the trucking business in the State.

The association also believed a tax of five cents would lead to the widespread sale of inferior gasoline meaning bad service to the buyer as well as being ruinous to his motor.

President J. Howard Pew of the Sun Oil Company appeared before the Ways and Means Committee of the House at Harrisburg to state the case for the oil industry which was given wide publicity throughout the state.

Mr. Pew cited the experience of Pennsylvania under the four cent tax, resulting in less revenue than the previous three cent levy, arguing excessive taxes would be uncollectible, encouraging tax evasion and bootlegging, and corruption on a scale so great as to mean the eventual breakdown of the entire system of highway maintenance.

This opinion has been established by the disclosures in several states of tax dodging, bribery of public employes, perjured reports, and downright theft of tax proceeds.

The effect of those conditions on the oil industry is now well known. Millions are filched from motorists and stolen from the state. Crooks and racketeers seeing the possibility of great profits sell gasoline without paying the tax, depriving the state of its revenue, cheating the public of its roads and demoralizing the legitimate market of responsible companies who do pay the tax.

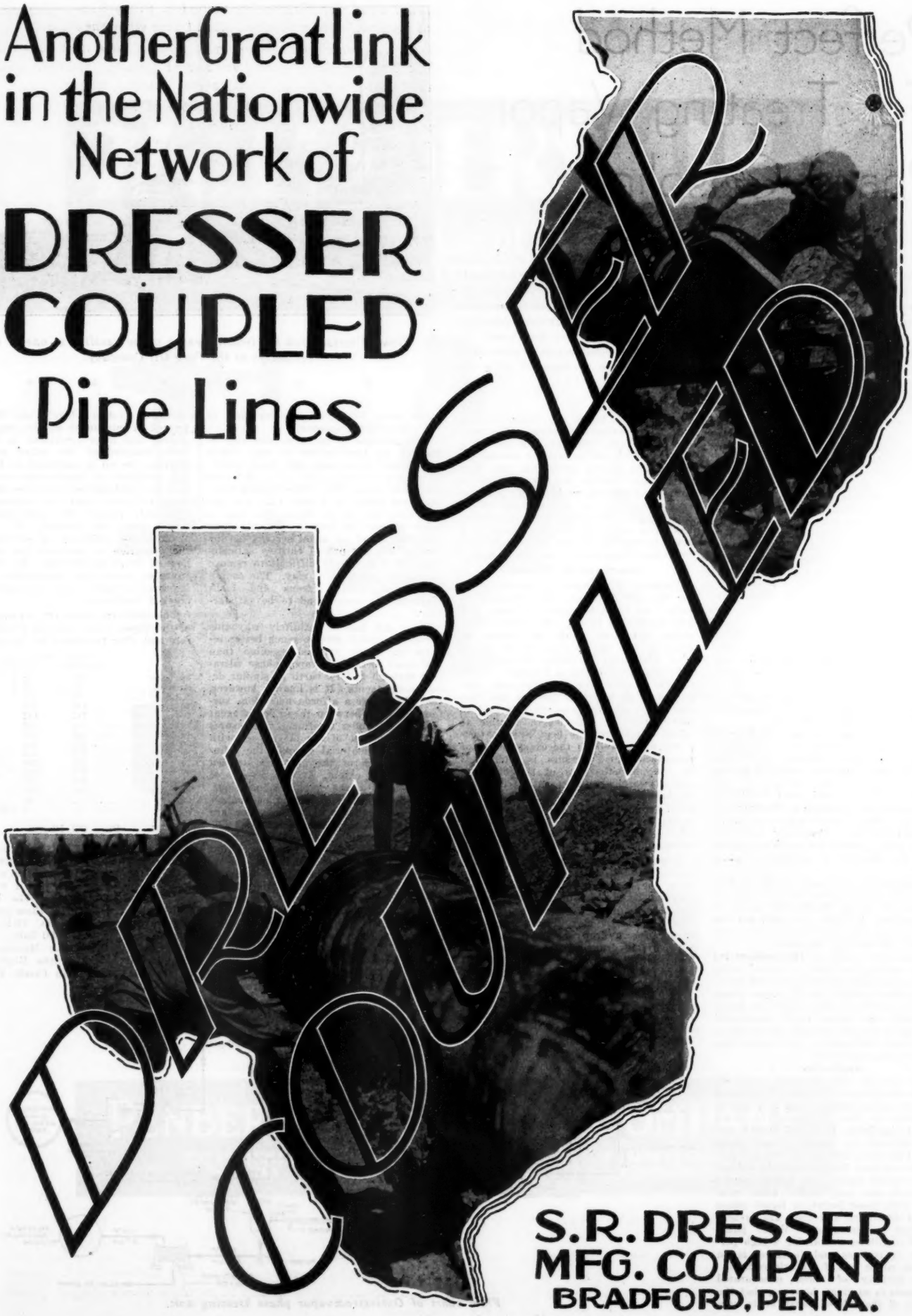
Mr. Pew offered one argument that has not been sufficiently put forward, the reasonable limit of gasoline taxation. He told the Pennsylvania legislators that a survey of the entire country demonstrates beyond doubt that three cents is the point of maximum productiveness for this tax. Above three cents the tax tends to lower consumption and revenue and to invite the bootlegger and the racketeer.

So convincing were the arguments presented that when the governor's original proposition was amended to fix the increase at one cent additional, instead of two, and to limit the increased tax to 15 months, the House voted it down by 191 votes to 7.

These facts which proved so conclusive to the legislature of Pennsylvania should be marshalled and presented to the people of every state which is considering an increase in the gasoline tax.

The Pennsylvania campaign was distinctive in that the oil companies and motor owners united to make a clearcut campaign against a gasoline tax increase. Their success should inspire similar united campaigns in any other state where the tax proposed is excessive.

# Another Great Link in the Nationwide Network of DRESSER COUPLED Pipe Lines




S. R. DRESSER MFG. COMPANY
BRADFORD, PENNA.

# Perfect Method For Treating Vapor Phase Gasoline

* * * * * *

By Dr. W. W. Holland

The rapid developments in the automotive industry have created many problems in the preparation of correct motor fuels. Perforce, this became the responsibility of the petroleum industry. Engines of the earlier type operated at low speeds and low compression ratios, and the so-called "straightrun" gasolines were satisfactory as fuels. These engines, however, were very inefficient. As motors were improved, the tendency was toward lighter construction, higher speed and compression ratios. Immediately difficulties were encountered with the grades of available fuel, due to their inclination to "knock." This resulted in reduced power and was also detrimental to the motor itself.

* * * *

At this point the petroleum industry accepted the problem of developing a satisfactory motor fuel and the means of accomplishing the desired results are well known. Among the early attempts to produce a suitable fuel was the cracking of heavy hydrocarbons in the vapor phase, as it was known that this type of fuel was very efficient because of its B.t.u. value and its inherently high antiknock properties. However, the many difficulties encountered caused this process to be abandoned temporarily, as it could not compete economically with the liquid phase process which was perfected about the same time.

In 1926 the Gyro Process Co., anticipating the demand of the future, undertook to solve the problems of vapor phase cracking, the most important of which was perfecting a satisfactory method of treating the cracked distillate whereby a water-white stable product of high antiknock value could be obtained.

Distillate of this character contains 40 to 45 per cent of aromatics, 45 to 50 per cent olefines and the balance naphthenes, with paraffins almost entirely absent. It was apparent that distillate of this nature would not lend itself readily to the conventional methods of treating and refining without sacrificing some of its desirable qualities. Treatment with sulphuric acid affected the antiknock properties and resulted in excessive treating losses.

Treatment in the vapor phase in contact with fuller's earth was difficult to control, due to the exothermic nature of the reaction. Further, the yield per ton of clay was very low and a more economical method was desirable.

Considerable study of the problem led to the conclusion that a process using high temperature and pressure and maintaining the distillate in the vapor phase would attain the desired results, be easily controlled and prove more economical than other known methods of treating. Subsequent developments have more than justified this conclusion.

### Application

This process was designed primarily for the treatment of distillate produced by vapor phase cracking, but it is equally applicable to the treatment of other cracked distillates. It is well known that it is difficult to convert vapor phase cracked distillate into water white, stable gasoline without heavy losses in volume and antiknock value. The highly colored compounds are very stable when compared with those found in liquid phase cracked distillates and they are present in higher concentrations. Vapor phase cracked distillates containing a high percentage of olefines and diolefines is an excellent motor fuel if properly refined.

The activity of these unsaturated compounds is so great, however, that the removal of the colored constituents usually results in losing a substantial quantity of the desirable fractions. The problem has been, therefore, to devise a method which will selectively remove the undesirable colored compounds and those unsaturates which readily oxidize to form pseudo-gums, without the unnecessary destruction of the valuable motor fuel fractions. To a very large extent this has been achieved by this process. A brief description of the process follows, reference being made to the flow sheet.

### Description of Process

Numeral 1 indicates a storage tank for the raw distillate. This distillate is picked up by a low-pressure pump (2) and discharged into a clay proportioned device (3) from which the mixture of distillate and clay is delivered by means of a high-pressure pump (4) into the tube still (5). Under a pressure of 200 to 500 pounds, the distillate and clay pass at high velocities through the tube still where the temperature is raised to 600 to 650° F. The length of time at which the mixture is kept at this temperature, as well as the exact choice of temperature and pressure, is determined by the characteristics of the distillate under treatment, the amount and kind of clay used and the quality of the finished product desired. Very fine fuller's earth, bentonite, Death Valley clay and other products of this nature have been successfully used.

Leaving the tube still, the mixture passes through orifice plates (6) to reduce the pressure. This method was found to be superior to the use of valves which were quickly cut out by the erosive action of the clay. The drop in pressure causes a drop in temperature and a vaporizing drum (7) is here provided to permit of separation of the clay and polymers from the gasoline fractions. The latter are delivered to a fractionating tower (8) which handles them in the conventional manner.

*View of installation for treating vapor phase gasoline at one of the refineries of the Pure Oil Company.*

* * * * * * * *

The mixture of polymers and clay is reduced in temperature to safe limits and passed to a tank (9) from which, by means of pump (10), it is fed into the filter press (11). The filtered polymers are stored in a tank (12) and the clay cake goes to the dump. The coke is fairly dry and the filtrate relatively clean oil. The use of all metal screens in this process has not proved entirely satisfactory, since it is very difficult to remove the finest particles of clay. The combination of metal screens and cloth blankets has been found to be satisfactory.

It is not known definitely why this operation should give so much better results on highly cracked gasoline than the usual method of vapor phase filtration through fuller's earth or similar decolorizing agents. It is known, however, that this process affords maximum surface exposure between the refining agent and the oil under treatment and insures intimate contact of the oil vapors with the treating material wherein the refining properties of the clay are utilized to the fullest extent. It also permits of close control of the operating conditions. Temperature, pressure, time of contact and the percentage of water vapor are susceptible of very fine regulation. The oil vapors are not exposed to partially spent clay, which, in the percolation method of filtration results in undertreatment. Nor do the vapors come in contact with an excessive amount of fresh clay, producing an overtreated product. The exothermic nature of the reaction adds to the difficulty of temperature control in the ordinary vapor phase filtration process, but in this improved method it lends itself readily to the desired operation.

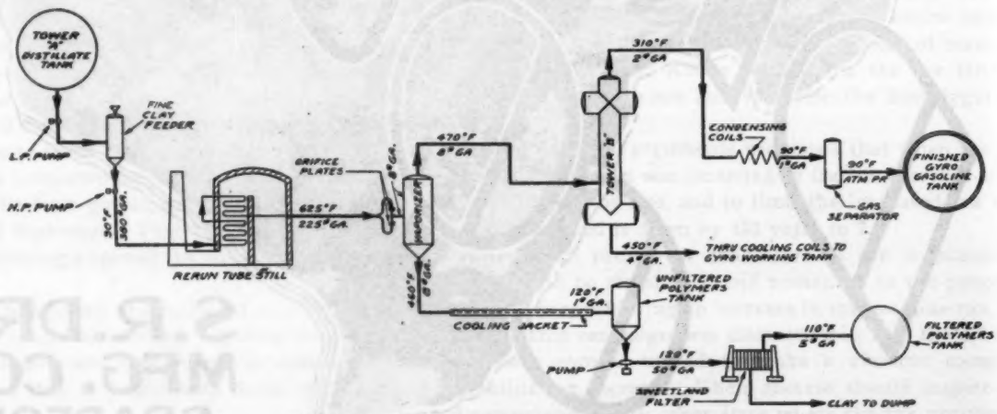
This process provides a continuously operating system wherein the oil to be treated is introduced at one end of the system and after treatment is continuously removed at the other end, and wherein the oil is subjected to fluctuating conditions of temperature and pressure, so regulated as to procure the maximum efficiency and to positively and effectively remove the undesirable materials from the treated oil. It also obviates the necessity of discontinuing the operation at intervals for the purpose of renewing the clay. In these advantages reside the superiority of this improved method of treating vapor phase cracked distillates.

The following data are representative of the vapor phase cracked distillate before and after treatment by this process:

| | Raw distillate | Finished gasoline | Polymers |
|---|---|---|---|
| Per cent | 100 | 92.8 | 6.11 |
| Gravity | 55.3 | 55.1 | 18.7 |
| I.B.P. | 90 | 100 | 392 |
| 10 per cent | 148 | 158 | 508 |
| 20 per cent | 182 | 192 | 556 |
| 30 per cent | 213 | 222 | 588 |
| 40 per cent | 248 | 254 | 612 |
| 50 per cent | 284 | 288 | 632 |
| 60 per cent | 308 | 314 | 654 |
| 70 per cent | 348 | 340 | 679 |
| 80 per cent | 374 | 362 | 716 |
| 90 per cent | 400 | 386 | 760 |
| Endpoint | 424 | 410 | ... |
| Color | ... | 30 | ... |
| Gum | ... | 0.2 Mg. | |

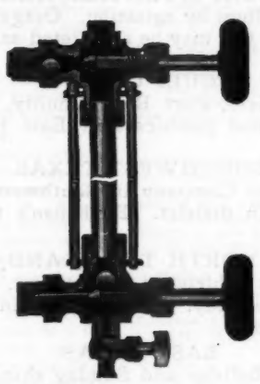
### Pure Oil Plants

The Pure Oil Co., which developed the Gyro vapor-phase cracking process, has units of the process in operation at six of its refineries operating with a wide variety of cracking stock. The location and crude oil capacity of these refineries are as follows: Toledo, Ohio, 8,000 bbls.; Heath, Ohio, 11,000 bbls.; Muskogee, Okla., 13,000 bbls.; Marcus Hook, Pa., 18,000 bbls.; Smiths Bluff, Tex., 30,000 bbls., and Cabin Creek, W. Va., 3,500 bbls.




*Flow chart of Osterstromvapor phase treating unit.*

# The LEADERSHIP of PENBERTHY PRODUCTS



*Safeguard Automatic Liquid Level Gauge*

*Navy Type Liquid Level Gauge*

*Gas Engine Lubricator*

*Snap Lever Oiler*

THE leadership of Penberthy Products is the inevitable result of years of conscientious effort to put better materials and a greater measure of skill in their manufacture.

Penberthy Products are known throughout the oil fields for their higher efficiency, greater dependability and longer life.

When you specify Penberthy Products you not only get the best but you save money in the long run. You can get Penberthy Products at your local supply house.

*Screw Plunger Grease Cup*

*Spring Compression Grease Cup*

*Plain Compression Grease Cup*

*Plain Brass Oil Cup*

## PENBERTHY INJECTOR COMPANY

ESTABLISHED IN 1886 — DETROIT — CANADIAN PLANT WINDSOR, ONT.

# GEOLOGISTS AND ALLIED GROUPS HOLD ANNUAL MEETING IN TULSA

With a registration of over 625 geologists and scientists on December 29 it seems assured that the total attendance will be 800 by the time the forty-fourth annual meeting of the Geological Society of America and its allied societies being held in Tulsa, draws to a close December 31. This is the first meeting of this society to be held west of the Mississippi River.

The technical sessions opened on Monday evening, December 28, with a series of papers dealing with geologic methods developed by the petroleum industry. Tuesday morning the sessions of the Geological Society of America, the Paleontological Society, Mineralogical Society, Society of Economic Geologists, and the American Association of Petroleum Geologists began, to be continued on through Wednesday and Thursday with over 130 papers in all to be presented.

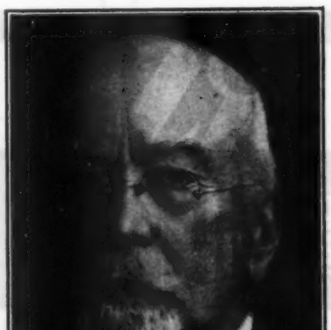
These papers will cover all phases of geology and will provide some very valuable data, not only for the petroleum geologists but for those who are engaged in geology as applied to other industries.

New officers will be elected at these meetings for the various societies, excepting the A.A.P.G. which will hold its seventeenth annual meeting in the Biltmore Hotel, Oklahoma City, Okla., March 24-26, 1932. The midyear meeting is being held in Tulsa at this time.

The Geological Society of America in addition to electing new officers also elected 40 of its members fellows of the society and it is of interest to note that Margaret Fuller Boos, of Bartlesville, Okla., has been included in this group. Others selected for fellowships represent all parts of this country, with several from Canada.

### Mendenhall Succeeds Smith

An announcement was received from Washington, D. C., that the appointment of Walter C. Mendenhall as director of the U. S. Geological Survey to succeed George Otis Smith has been confirmed. This news is of interest to petroleum geologists as many of them have served on the U. S. Geological Survey staff from time to time. Mr. Mendenhall has been connected with the survey since 1894 and has a wide acquaintance among geologists in all parts of this country.



**Dr. William Morris Davis**

Professor emeritus of geology at Harvard University, to whom the Penrose medal for outstanding work in the field of geology is awarded for 1931.

Following the technical sessions in Tulsa several field trips have been planned to permit visitors to examine the geological features of the Ardmore Basin, Ouachita Mountains and the Wichita Mountains, all in Oklahoma.

## *High Spots in Field News*

**NORTH LOUISIANA, ARKANSAS, MISSISSIPPI**

Floods slow activity in Arkansas. Gas wells feature completions in the three states. Three failures in Zwolle area.

**KANSAS**

Ellsworth-Barton Arch area placed on 40-acre unit basis. Voluntary curtailment is being suggested in other pools.

**MICHIGAN**

New gas well in Grant Township, Clare County, gauged at 16,000,000 feet. Leaton Pool has 700 bbl. oil producer.

**CALIFORNIA**

Some Long Beach operators refuse to support California curtailment order. Production situation again regarded as serious.

**OKLAHOMA**

New well in Oklahoma City makes 6,392 bbls. in 75 minutes. Daily allowable of field reduced to 160,000 bbls. Leasing continues active.

**ROCKY MOUNTAIN AREA**

Greasewood well flows by agitation. Osage field most active in Wyoming. Whitlash test may be completed as producer at present depth.

**GULF COAST**

New Thompson field, Fort Bend County, extended half mile south. Two more good producers in East Hackberry, Cameron Parish.

**SOUTHWEST TEXAS**

Well of The Texas Company in Southwest end of Pettus extension one of best in district. Buchanan's test in Bee County looks like well.

**WEST TEXAS, NORTH TEXAS AND PANHANDLE**

Resume drilling in Schleicher County test. Irion County deep test seeks Big Lake pool pay. Five locations in Wichita Falls area. New Moore County test.

**EAST TEXAS**

Impassable roads, holiday and Sunday shutdown cut new locations to 38 and completions to 47. Total operations now 676. Van Field output also curtailed.

## Late Fields

### SOUTHWEST TEXAS

SAN ANTONIO, Tex., Dec. 29.—The Texas Company's No. 1 Gremmel, at the southwest end of Pettus extension, came in making 900 bbls. on five-eighths inch choke at 3,908 feet, one of the best wells in Pettus district. Slick Estate is moving in to offset it on the east and Buck Oil Corp. to offset it on the south. Al Buchanan's No. 1 Dorenfield, 1,000 feet east of Simms Oil Co.'s gasser on Holzmark, in Bee County, first testing very little gas and looking like a failure, stood for a few days and has developed 700 pounds pressure and begins to look like a well.

### OKLAHOMA

Mid-Continent Petroleum Corp.'s No. 1 Farmer, SE cor. SW NW, Section 2-6-4, a wildcat in Pottawatomie County, has cemented casing at 4,156 feet, while the total depth of the test is 4,255 feet. The top of the Simpson was found at 4,240 feet.

Carter Oil Co. and others' No. 1 Monette, SW cor., Section 35-7-4, a wildcat in Pottawatomie County, found the top of the Viola lime at 4,147 feet and was drilling at that depth.

During the week Judge T. G. Chambers, in the district court in Oklahoma County, held that the Oklahoma City school board is entitled to one-sixth of the royalty interest in Anderson-Kerr and others' oil well in the 300 block of southeast Thirty-eighth Street, adjoining the Shields school property. The school property is no part of the lease. The school board brought the suit, holding that property within drainage area of an oil well is entitled to an interest in the production. The well is estimated as good for 35,000 bbls. in one day.

The production of the Oklahoma City Field, during the week ending at 7 a.m. on Sunday, December 27, averaged 169,184 bbls. per day. The daily average was as follows:

| Date— | Prod. | Wells |
|---|---|---|
| December 20 | 121,913 | 135 |
| December 21 | 248,073 | 179 |
| December 22 | 250,202 | 139 |
| December 23 | 213,635 | 169 |
| December 24 | 153,100 | 135 |
| December 25 | 129,300 | 121 |
| December 26 | 67,975 | 99 |

Another gas well was completed in the gas area near Perry in Noble County. Continental Oil Co.'s No. 1 Waltermire, in Section 33-21-1w, was estimated at 10,000,000 feet a day. No sand record was available.

The daily production of the Oklahoma City Field on December 29 was 204,215 bbls. from 167 wells.

Conservation Oil Co.'s No. 1 Hart, NW cor., Section 27-5-6, Pontotoc County, was drilling deeper at 1,641 feet. The test found a showing of gas at 1,623-28 feet, in sand. A dry sand was found at 1,631-35 feet.

### KANSAS

Another wildcat test on the Barton Arch in the central part of Kansas was showing oil in the Silicious lime. The test is Rosenthal and others' No. 1 Gray, in Section 11-24-13w, Stafford County, which found the Silicious lime at 3,839-52 feet, and drilled to a depth of 3,891 feet. Another oil showing was found at 3,749-53 feet, where oil rose 700 feet in the hole and it tested between 75 and 90 bbls. a day.

The Kansas Public Service Commission may prorate the Welch Pool in southeastern Rice County. It is believed the commission has included this field in a list with several others that have not been prorated up to the present time.

Paul Gano and others' No. 1 Brown, NE cor. SW Section 10-21-6w, in the Welch Pool in Rice County, found a hole full of water in the chat at 3,480 feet.

New operations reported in Kansas in the week ending December 26 total 11. McPherson County leads with three operations, two being in the Ritz-Canton Pool and the other in the Voshell Pool. Greenwood, Cowley and Stafford Counties each had two and Sedgwick and Barber Counties report one each.

Barnsdall Oil Co. and others' No. 1 Schacht, SE cor. NW SW Section 25-16-10w, Ellsworth County, was drilling in the Silicious lime at 3,365 feet, with a showing of oil. The top of the Silicious lime was found at 3,363 feet. It is located about 2 miles northwest of the J. A. Aylward's 2,500-bbl. well in Section 1-17-10w.

### LONE STAR DECISION

DALLAS, Tex., Dec. 28.—The decision of the district court at Waurika, Okla., in favor of the Lone Star Gas Co. in its litigation with the State of Oklahoma on questions involving taxes and penalties amounting to approximately $400,000 is held by company attorneys to be, in effect, a dismissal of the case as far as the taxes and penalties involved are concerned. The only question retained by the court was the company's alleged discrimination in rates. It is the opinion of attorneys representing the company that since all rates have been in strict accordance with schedules filed with and approved by the Corporation Commission, the opinion just rendered virtually ends all litigation.

### CALIFORNIA SALES AGENCY

LOS ANGELES, Calif., Dec. 26.—Members of the Oil Producers Sales Agency of California, in the referendum vote conducted by authority of the executive committee, voted in favor of a tariff on crude petroleum and petroleum products. A few votes were registered in favor of a temporary embargo. The board of directors instructed the executive committee to memorialize the President and Congress urging that necessary action be taken to protect the oil industry from foreign oil importations.

William H. Geis and H. A. Bardeen were elected at the meeting of the board of directors to serve as members of the executive committee, in lieu of William Keck and C. P. Watson, resigned.

### JAPS BUY PIPE MACHINERY

A complete set-up of machinery for manufacturing large diameter steel pipe by the Electronic Tornado process of automatic welding in a shielded arc has just been ordered by the Asano Dockyard Co. of Japan from the Lincoln Electric Co. of Cleveland, Ohio. Installation of this machinery will be supervised by T. Y. Inagaky, Tokyo representative of the Lincoln Electric Co.

This, the second order in the past six months for a pipe factory installation of this kind in Japan, follows the successful operation of the same type of equipment in the Kobe plant of the Kawasaki Dockyard Co.

### TO USE MEXICAN OIL

The Standard Oil Co. of Indiana will operate its Mexican refineries on Mexican crude and stop imports of refined products from Venezuela, in line with Mexican government wishes.

William Green, vice president and general manager of Huasteca Petroleum Co., announced that Huasteca would resume activities in oil production and refining on January 1. The program includes construction of an additional unit at the Tampico refinery of the company, increasing the capacity of the latter by an additional 3,500 bbls. a day.

# Resume Drilling in Schleicher Test

## Irion County Deep Test Seeks Deep Pay Found in Big Lake Pool. New Test in Moore County. Five Locations in Wichita Falls Area

By L. E. Bredberg
*Fort Worth Bureau, The Oil and Gas Journal*

FORT WORTH, Tex., Dec. 28.—Two locations were staked in Loving County during the week, and one in the McElroy Pool, Crane County. Production was cut from 198,596 bbls. as of last week to 176,954 bbls. this week, the Sunday shutdown curtailing production. Practically all of the major producing companies operating in West Texas shut down on December 20 and were expected to shut down on December 27. No report has been received about the latter day's shutdown, although all companies seemed in favor of it, and it was almost an assured fact that they would shut in their wells. The Texas Pacific Coal & Oil Co. and Sun Oil Co. shut in all their wells in the Hobbs area, New Mexico, and the Humble Oil & Refining Co. shut in all but one well. Other producers in that field did not shut in their production.

### Schleicher County

Schleicher County's interesting wildcat, which has been shut down for some time, has resumed drilling and is now below 5,250 feet. This test is J. W. Wesner and others' No. 1 Nicks in Section 77, Block LL, T. C. Survey, north of the town of Eldorado. The test created considerable excitement several months ago when it encountered a good showing of oil below 4,000 feet. It had the best showing of oil ever encountered in a test in this county, looking at first as if it would make a commercial producer. Drilling deeper failed to pick up an increase in pay, and now the test does not look so promising.

### NORTH TEXAS PRODUCTION
**Week Ending December 26**

| | |
|---|---|
| Panhandle district— | |
| Carson County | 5,635 |
| Gray County | 32,778 |
| Hutchinson County | 11,372 |
| Moore County | 3,293 |
| Wheeler County | 416 |
| Total production this week | 51,494 |
| Total production last week | 52,475 |
| Decrease | 981 |
| Wichita Falls district— | |
| Archer County | 11,786 |
| Baylor County | 505 |
| Clay County | 551 |
| Cooke County | 2,106 |
| Foard County | 77 |
| Haskell County | 24 |
| Jack County | 1,841 |
| Montague County | 4,576 |
| Throckmorton County | 481 |
| Wichita County | 16,736 |
| Wilbarger County | 11,457 |
| Young County | 10,910 |
| Total production this week | 61,050 |
| Total production last week | 61,943 |
| Decrease | 893 |
| Ranger district— | |
| Brown County | 2,827 |
| Callahan County | 1,467 |
| Coleman County | 2,756 |
| Comanche County | 693 |
| Palo Pinto County | 326 |
| Eastland County | 2,578 |
| Shackelford County | 3,347 |
| Stephens County | 3,916 |
| Total production this week | 17,910 |
| Total production last week | 18,441 |
| Decrease | 531 |

### Irion County

Plymouth Oil Co. is now running 8-inch casing in its No. 1 Sugg in Section 2,081, Block 28, H.&T.C. Survey, Irion County. Total depth is 5,627 feet. This is a deep test which is being drilled in an effort to pick up the deep pay found in the Big Lake Pool to the west in Reagan County.

### Ector County

Weekley and others' No. 1 Cowden in Section 33, Block 43, Township 2s, T.&P. Survey, Ector County, is rigging up rotary to fish out tools and continue drilling. Total depth is 3,798 feet. Gas remains around the same as estimated previously when it was struck and blew tools up in the hole, lodging them and causing a fishing job.

### Panhandle District

Another cut in production was registered in this district during the week, production falling off another 981 bbls. daily, or to a daily average of 51,494 bbls. The Wichita Falls district also fell 893 bbls. per day, and the Ranger district 531 bbls. per day.

The Thunderbolt Oil Co. has staked location for a test in Section 277, Block 44, H.&T.C. Survey, in Moore County, and gas lines have been laid from the Shamrock wells to the north to this location to supply the test with gas for drilling. It is expected to spud in the first week in January.

The one-seventh curtailment or Sunday shutdown has gone into effect in the Panhandle, the pipe lines buying ratably on that new voluntary curtailment plan.

### Wichita Falls

Locations in this district dwindled to five this week, probably due to the holiday shutdown and for general curtailment reasons. Four were located in Archer and one in Young County.

The Shaw Oil Co. of Dallas was reported to have sold producing properties in Archer, Jack, Cooke, Gray and Young Counties to the King Royalty Co. of Wichita Falls for a cash consideration of around $100,000. This is the largest sale which has taken place in this district for some time.

## WILDCAT OPERATIONS IN WEST TEXAS

Week Ending December 28

| Company, well, farm name, section and block— | Remarks |
|---|---|
| **BREWSTER COUNTY** | |
| Brewster Oil Co.'s No. 1 fee, 2,640 ft. S and 2,598 ft. E of NW cor. Sec. 45, Blk. G-15, G.C.&S.F. Sur. | S.D. 1,935 ft. |
| E. L. Chapmah's No. 1 Skinner, C SW SE Sec. 100, Blk. 2, G.C.&S.F. Sur. | S.D. 1,302 ft. |
| Trans-Pecos Oil & Gas Co.'s No. 1 Jones, 920 ft. from N and 2,500 ft. from E of Sec. 18, Blk. G-15, G.C.& S.F. Sur. | S.D. 2,900 ft. |
| Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 miles south Alpine | S.D. 1,750 ft. |
| **COCHRAN COUNTY** | |
| Penn Oil Co.'s No. 1 Slaughter, C Labour No. 80 of League 129, Carson County School Lands | Shut down 4,917 ft. |
| **CONCHO COUNTY** | |
| Beesley et al's No. 1 Waring Estate, 400 ft. from N and E Sec. 162, T.&N.O. Sur. | S.D. |
| Turner et al's No. 1 Borsig, 150 ft. from S of NE cor. G. Emmig Sur. 130, 6 miles W of Paint Rock | S.D. 1,850 ft |
| **CRANE COUNTY** | |
| Gulf Prod. Co.'s No. 8 McElroy, 2,310 ft. from N and E of Sec. 196, Blk. F, C.C.S.D.&R.G.N.G. Sur. | Drlg. 2,210 ft. |
| **CROCKETT COUNTY** | |
| Doleman & Moore's No. 1 Ferner 2,135 ft. from N and 1,485 ft. from E of Sec. 36, Blk. 2, I.&G.N. Sur. | Spudded and S.D |
| **CULBERSON COUNTY** | |
| Kornrumpf et al's No. 1 Garren, 330 ft. S and W, Sec. 15, Blk. 79, Public School Land | S.D. 1,280 ft. |
| **DAWSON COUNTY** | |
| Albaugh et al's No. 1 Robinson, C NW Sec. 46, Blk. M, H.L.&R.R. Sur. | To resume drilling. |
| **ECTOR COUNTY** | |
| Weekly Oil Corp. et al's No. 1 Cowden, 1,980 ft. from N and W Sec. 33, Blk. 43, Twp. 2s, T.&P. Sur. | Fishing 3,797 ft.; est. 500,000 ft. gas 3,795 ft.; increase 3,797 ft. |
| H. F. Wurts' No. 1 E. A. Ibbetson et al, 330 ft. from N and E lines of NW, Sec. 16, Blk. 46, Twp. 3s, G.M. M.Br.&A. Sur. | S.D. 3,280 ft. |
| **EL PASO COUNTY** | |
| Tri-State Oil Co.'s No. 1 Bobadella, 1,325 ft. from S and E lines Sur. 254, S.F. No. 7,247 | Shut down 1,960 ft. |
| **FISHER COUNTY** | |
| Cranfill & Reynolds' No. 1 George, 400 ft. from N and 380 ft. from E, Sec. 200, Blk. 1, B.B.&C. Sur. | Shut down 3,795 ft. |
| Cranfill & Reynolds' No. 1 Snipe, 330 ft. from N and W lines of Sec. 196, Blk. 1, B.B.&C. Sur. | Drlg. 2,650 ft. |
| Texas Inland and Zingling's No. 1 Wm. Flannigan, 240 ft. from E and 165 ft. from W line of S 20 acres of SW Sec. 20, B.B.B.&C.R.R. Sur. | Spudded. |
| **GARZA COUNTY** | |
| Penny & Posey's No. 1 Justice, 1,980 ft. from S and 1,650 ft. from E of Sec. 35, Blk. 6, H.&G.N. Sur. (3,500-ft. cable tool test) | Fishing for 6⅝-in. csg.; T.D. 3,320 ft. |
| **HOWARD COUNTY** | |
| Green O. & R. Co.'s No. 1 Denman, 990 ft. from S and 2,310 ft. from W Sec. 14, Blk. 29, Twp. 1s, T.&P. Sur. | Spudded and S.D. |
| L. C. Harrison et al's No. 1 L. C. Denman, 2,310 ft. from S line and 330 ft. from E line of Sec. 10, T.&P.R.R. Sur., Blk. 30 | Drlg. 1,890 ft. |
| **IRION COUNTY** | |
| Davis et al's No. 1 Sugg, 1,560 ft. from S and 925 ft. from W Sec. 3,081, Blk. 28, H.&T.C. Sur. | Shut down 5,627 ft. |
| Ellis Flanery Corp.'s No. 1 Nutt, 1,350 ft. from N and 450 ft. from E of Sec. 694, Kheikenholm Sur. | Shut down 2,900 ft. |
| Stanolind Oil & Gas Co.'s No. 1 Williams, 1,320 ft. from S and E of Sec. 1,196, T.T.R.R. Sur. | Rigged up rotary 6,795 ft. |
| Straughn & Adkins Bros.' No. 1 Lee, 1,080 ft. from W and 420 ft. from N of Sec. 729, C. Kaiser Sur. | Total depth 1,125 ft. |
| **JONES COUNTY** | |
| Johnson's No. 1 Huddleston, 165 ft. from S and W of N half of N half of Sec. 39, Blk. 18, T.&P. Sur. | Rig up. |
| Young et al's No. 1 Harrell, 150 ft. from S and E of N half of Sec. 8, O.A.L. Sur. | Location. |
| Abers et al's No. 1 Burton, 150 ft. from S and 175 ft. from E of 43.4-acre tract in G. Martinez Sur. | S.D. 1,005 ft.; temporarily abandoned. |
| **LOVING COUNTY** | |
| Adams et al's No. 1 Wheat, 330 ft. from SE and SW of Sec. 89, Blk. 1, W.&N.W. Sur. | Location. |
| Ervin & Mahres' No. 1 Thrope, 2,310 ft. from E and 330 ft. from S Sec. 46, Blk. 63, T.&P. Sur. | S.D. 810 ft. |
| Slack's No. 1 Lynd, 990 ft. NE and 330 ft. SE of Sec. 3, Blk. 2, W.&N.W. Sur. | Shut down 4,044 ft. |
| Falbre & Evans' No. 1 Dean, 330 ft. from NE and 990 ft. from NW Sec. 79, Blk. 33, H.&T.C. Sur. | S.D. 2,500 ft. |
| Lewis & Slagel's No. 1 Johnson, 330 ft. from N and 1,650 ft. from W Sec. 6, Blk. 56, Twp. 1, T.&P. Sur. | Shut down 250 ft. |
| Lockhart & Co.'s No. 3 Bowen & Wells, 330 ft. from NE and SE of Sec. 92, Blk. 1, W.&N.W. Sur. | S.D. 3,385 ft. |
| Phillips Pet. Co.'s No. 3 Wheat, 330 ft. from SW and 2,310 ft. from SE Sec. 85, Blk. 1, W.&N.W. Sur. | Location. |
| Tennant et al's No. 1 Martin, 990 ft. from NW and SW Sec. 66, Blk. 1, W.&N.W. Sur. | Drlg. 3,780 ft. |
| **MENARD COUNTY** | |
| Priest's No. 1 Sorrel, 1,000 ft. from E and 200 ft. from S cor. Sec. 132, H.L.R.R. Sur. | S.D. 2,860 ft. |
| **PECOS COUNTY** | |
| Anderson's No. 1 Le Fever, 330 ft. from N and W of Sec. 78, Blk. 8, H.&G.N. Sur. | Shut down 1,030 ft. |

(Continued on Page 94)

### COMPLETIONS IN WEST TEXAS

#### Crane County

Gulf Production Co.'s No. 89 McElroy, total depth 3,000 feet, plugged back to 2,974 feet, top pay 2,824 feet, shot 180 quarts 2,824-2,950 feet, initial production 1,355 bbls. first 13 hours.

#### Howard County

Merrick-Lamb's No. 2 Chalk, total depth 3,292 feet, plugged back to 1,877 feet, initial production 11 bbls. per hour pumping.

#### Fisher County

The Texas Company's No. 1 Daniel (formerly reported as Burnham), top pay 3,097 feet, initial production 87 bbls. first hour, total depth 3,097 feet.

### WEST TEXAS PRODUCTION
**Week Ending December 26**

| County— | No. wells | Prod. |
|---|---|---|
| Crane | 377 | 16,213 |
| Crockett | 51 | 1,024 |
| Ector | 78 | 5,631 |
| Fisher | 79 | 837 |
| Garza | 2 | 20 |
| Howard-Glasscock | 544 | 23,195 |
| Irion | 9 | 40 |
| Jones | 89 | 1,229 |
| Loving | 46 | 3,245 |
| Mitchell | 111 | 1,505 |
| Pecos | 551 | 59,528 |
| Reagan | 355 | 24,342 |
| Runnels | 5 | 60 |
| Scurry | 5 | 0 |
| Upton | 266 | 4,270 |
| Taylor | 266 | 63 |
| Ward | 79 | 3,674 |
| Winkler | 595 | 32,078 |
| Total production this week | | 176,954 |
| Total production last week | | 198,596 |
| Decrease | | 21,642 |

### SHIPMENTS THROUGH TRUNK LINES

| Company, size and location— | Bbls. |
|---|---|
| Atlantic P. L. Co., 10-in., Houston | 26,187 |
| Gulf Pipe Line Co., 10-in., Ranger | 30,593 |
| Humble Pipe Line Co., 2 and 8-in., San Angelo | 2,881 |
| Humble Pipe Line Co., 12-in., Comyn | 48,447 |
| Illinois Pipe Line Co., 2 and 8-in., Del Rio | 25,206 |
| Magnolia Pipe Line Co., 8-in., De Leon | 10,197 |
| Paso-Tex, 8-in., El Paso | 5,986 |
| Shell Pipe Line Co., 10-in., Cushing, Okla. | 36,774 |
| Shell Pipe Line Co., 10-in., Houston | 21,015 |
| Texas Pipe Line Co., 12-in., Houston | 14,149 |
| Total | 221,435 |

### SHIPMENTS TO REFINERIES

| | |
|---|---|
| Burford Ref. Co., Pecos | S.D. |
| Cosden Ref. Co., Big Spring | 4,275 |
| Col-Tex Ref. Co., Colorado | 6,900 |
| Great West Ref. Co., Big Spring | 1,700 |
| Continental Ref. Co., Pyote | S.D. |
| Wickett Ref. Co., Wickett | 602 |
| Signal Ref. Co., Santa Rita | 450 |
| Howard County Ref. Co., Big Spring | S.D. |
| Total | 13,927 |

### SHIPMENTS BY TANK CARS

| | |
|---|---|
| Fox & Thorsen, from Mertzon | 30 |
| Total | 30 |
| Daily average distribution | 235,392 |
| Daily average production | 196,632 |
| Daily average to storage | 1,819 |

# Shut Down Success in East Texas Area

## Thirty-eight New Locations Reported and 47 Completions, With 676 Total Operations. Van Field Output Also Curtailed

By L. E. Bredberg

DALLAS, Tex., Dec. 28.—On December 20 there were 1,948 wells shut in in the East Texas district by those subscribing to the voluntary Sunday shut down. There were 23 independent producing companies and 20 major and larger producing companies listed on this shut down report. It was believed a good many more independent operators would adopt the movement on December 27, but no check has yet been made of the additional wells being shut down on that date. H. L. Hunt was the largest independent producer shutting down his wells. He closed 72 on Sunday. The East Texas Refining Co. was next with 53 wells. Other independents on the list had one, three or five wells, with but a few over six wells producing. Roeser & Pendleton shut in 22 and Snowden and McSweeney shut in 11.

The major and larger producing companies to shut down their wells in the field were as follows:

| Company— | No. wells shut in |
|---|---|
| Atlantic Oil Production Co. | 40 |
| Barnsdall Oil Co. | 22 |
| California Petroleum Co. | 23 |
| Devonian Oil Co. | 17 |
| Gulf Production Co. | 223 |
| Humble Oil & Refining Co. | 426 |
| Magnolia Petroleum Co. | 199 |
| Mid-Kansas Oil & Gas Co. | 36 |
| Prairie Oil & Gas Co. | 25 |
| Shell Petroleum Corp. | 115 |
| Simms Oil Co. | 8 |
| Sinclair Oil & Gas Co. | 132 |
| Stanolind Oil & Gas Co. (Simms Oil Co. has half interest in many of these wells) | 89 |
| Sun Oil Co. | 97 |
| The Texas Company | 75 |
| Tidal Oil Co. | 110 |
| Vacuum Oil Co. | 14 |
| Yount-Lee, Inc. | 79 |

### Progress of Shut Down

The policy of the Atlantic Oil Producing Co. was to shut in only those wells offsetting wells of other producers which were shut in. The Magnolia Pipe Line Co., Atlantic Pipe Line Co., Sun-Yount Lee Pipe Line Co., Sinclair Pipe Line Co., Prairie Pipe Line Co., Tidal Refining Co., Stanolind Pipe Line Co., The Texas and Texas-Empire Pipe Line companies, Shell, Panola and Gulf Pipe Line companies shut down on December 20 and 27, not running any oil out of the district during those two days, and will shut down on every Sunday hereafter. The Arkansas Pipe Line Co., Empire Pipe Line Co., Crown, Toronto, Inland Waterways, Sabine and Tyler Pipe Line companies did not shut down. The majority of these are small gathering lines, running oil to loading racks and storage.

The Gulf Production Co. shut down its wells on Chistmas day, and stopped all drilling from noon December 24 to December 28. Pipe line runs for December 24, 25 and 26 totaled only 748,147 bbls., while production for December 25 was cut to 324,236 bbls. and on December 26 to 213,168 bbls. The shut down on December 27 meant a curtailment of weekly production of around 195,000 bbls. in the district if the same number of companies shut in their wells as closed them on December 20. However, it was believed a larger percentage would shut in their wells, consequently the curtailment would be larger, amounting to over 200,000 bbls. for that day, or nearly two-thirds of the daily average production.

On Christmas day there were 241 wells shut in in the field, and next day 1,337 wells, which helped further in curtailing production from the East Texas district during the week. The following is a production report for the district for four days, from December 23 to December 26, inclusive:

| | To 7 a.m. Dec. 23 | Dec. 24 | Dec. 25 | Dec. 26 |
|---|---|---|---|---|
| Total wells | 3,573 | 3,588 | 3,596 | 3,596 |
| Wells reporting prod. | 3,486 | 3,429 | 3,252 | 2,180 |
| Wells not reporting prod. | 36 | 83 | 53 | 61 |
| Production | 346,274 | 344,824 | 324,236 | 213,168 |
| Pipe line runs | 311,200 | | | *748,147 |
| Wells shut down for Christmas | | | 241 | 1,337 |

*For three days, December 24, 25 and 26.

From this report it can easily be noted that pipe line runs are from 35,000 to 43,000 bbls. per day less than the daily average production, which will no doubt have considerable weight in bringing other producers to shutting in their wells on Sundays. All producing wells do not have connections, and General Wolters called a conference at general headquarters today inviting representatives of all of the major purchasing companies to be present to discuss the problem of facilitating pipe line connections to the small operators. This is the same old question which comes up in every pool, and General Wolters desires settling it at the beginning, instead of having more and more unconnected wells being added to the list each week, piling up trouble for those in charge of curtailment in the district.

### Total Recovery

Total recovery for the district to December 22 is listed as follows for the three connected areas:

| | |
|---|---|
| Joiner (the first area opened) | 35,437,835 |
| Kilgore or Bateman (second area opened) | 42,457,431 |
| Lathrop or Longview (last area opened) | 25,344,170 |
| Total | 103,239,426 |

There has been an estimated 1,000,000 bbls. of oil which has been reported produced and shipped from the district has never been entered on production and pipe line or tank car shipment reports, consequently is not included in the above figures. This oil was run while the field was producing wide open and before the troops were sent into the district to take charge of curtailment of production.

### Locations and Completions

Impassable roads in the fields, the shutdown during Christmas week, Sunday shut in of production and pipe line runs, all worked in conjunction to curtail the number of locations staked in the field and the number of wells completed during the week. There were only 38 locations reported and 47 wells completed, the smallest number of locations and completions during the past 10 months. Impassable conditions of the roads are not expected to continue as a hindrance to field activities, and this lull in the staking of locations, and the bringing in of new wells is considered as only temporary.

There were 11 wells completed in north Gregg, 12 in south Gregg, 18 in south Rusk, 4 in Smith and 2 in Upshur County. Twelve locations were staked in north Gregg, 11 in south Gregg, 5 in north Rusk, 9 in south Rusk and 1 in Upshur. Gregg County remains the most active area, especially north Gregg, while activities in Upshur and Smith Counties are subsiding somewhat.

There are 676 operations in the district at the present time. Of these 676 operations, 136 are locations, 180 are derricks standing waiting for tools, 66 are rigging up, 234 are drilling and 58 are shut down. Two hundred and fifty-two of the operations are in north Gregg, the Lathrop area; 38 are in the Gladewater-Upshur County area; 137 are south of the Sabine River in south Gregg, 71 in the Kilgore area, 149 in the Joiner area of southern Rusk and 29 in the Joiner-Smith County area.

The eight largest producers and most active companies in the district show their activities to be as follows:

| Company— | Producing | Active | Actual drlg. |
|---|---|---|---|
| Humble Oil & Ref. Co. | 433 | 54 | 16 |
| Gulf Production Co. | 223 | 30 | 15 |
| Magnolia Pet. Co. | 207 | 21 | 6 |
| Sinclair Oil & Gas Co. | 161 | 12 | 6 |
| Shell Petroleum Corp. | 115 | 14 | 1 |
| Sun Oil Co. | 96 | 23 | 11 |
| Tidal Oil Co. | 91 | 12 | 4 |
| Stanolind O. & G. Co. | 90 | 20 | 6 |

The Sunday shutdown on December 20 reacted during the week ending December 23, making it necessary to withdraw 30,254 bbls. daily from storage to meet distribution requirements. The week previous oil had been run to storage at the rate of around 10,000 bbls. per day, and for the four days, December 23, 24, 25 and 26, oil again went into storage, pipe line runs being far below production during that time, which probably meant a less demand during the last few days.

### Van Field Curtailment

The Pure Oil Co. has also cut production in the Van Field, Van Zandt County. Wells will not be shut in every Sunday, but production will be curtailed one-seventh, pipe line runs cut accordingly. Curtailing daily production by one-seventh is advised by the company because of certain operating conditions. Daily allowable of the field is 50,000 bbls.

### Interesting Tests

Peyton Brothers' No. 1 Perry in the Sparks Survey, south of production in the Joiner Pool, southern Rusk County, is shut down waiting on cement to set after cementing 6⅝-inch casing at 3,636 feet. Plug will not be drilled until after the first of the year. Total depth of the hole remains at 3,718 feet where it was shut down after striking an estimated 3,000,000 to 4,000,000 feet of dry gas. The well is approximately 3 miles south of the nearest production in the field and means a considerable extension, proving up several hundred more acres good for production in the field, but whether it makes a producer remains to be proved when the plug is drilled. Many are of the opinion it will make a well when a test is made, while others hold the opinion that the dry gas proves it a failure so far as oil production is concerned. It is the first test in the district to strike dry gas, and showing no oil.

Cranfill & Reynolds' No. 1 Rash in the Eubanks Survey, in southeastern Upshur County, and north of Gregg County production, is scheduled to drill plug immediately after first of the year, and a test made. This test made some oil on a drill stem test before casing was cemented, consequently is an exceptionally interesting well, and will be closely watched when given the second test. It also means another extension to the field if it makes a producer. Total depth is 3,728 feet. Elevation is 329 feet.

Drilling & Exploration Co.'s No. 1

(Continued on Page 90)

## EAST CENTRAL TEXAS WILDCATS

Week Ending December 28

**ANDERSON COUNTY**

| Company, well, farm name, section and block— | Remarks: |
|---|---|
| C. R. Wilmuth et al's No. 1 N. B. Watson, 500 ft. from W line and 4,850 ft. from N of S line of survey in S half of 129-ac. tract, M. Main Sur. | S.D. 800 ft. |

**BOWIE COUNTY**

| | |
|---|---|
| Logan and Elliott's No. 1 J. W. Smith, 9,600 ft. S and 2,500 ft. W of NE cor. of survey, Charles Lewis Sur. | S. D. 4,503 ft. |
| W. S. Langford's No. 1 W. W. Whybark, 200 ft. from S and W of SW cor. of J. A. Dyer Sur. | S.D. 1,880 ft. |
| Lee Timberlake et al's No. 2 Julius N. Tidwell, 665 ft. from E and 2,510 ft. from S of survey in L. M. Rice Sur. | S.W. on drill stem test; S.D. 3,613 ft. |

**CHEROKEE COUNTY**

| | |
|---|---|
| Bridges and Candler's No. 1 Berryman, center of Berryman tract, H. Kimble Sur. | S.D. 1,000 ft. |
| Denman et al's No. 1 Mrs. Renfroe, 330 ft. N of S line and 330 ft. E of W line of farm, Uriah Moore Sur. | Derrick. |
| Harper and Perkinson's No. 1 J. T. Lowery, 650 ft. from N line, 150 ft. from W line of Block No. 5 on a 139.6-ac. tract, 4 miles W of Troupe, C. B. Jennings Sur. | Rigging up. |
| Wilson & Stubbs' No. 1 L. Robart, 450 ft. from S and 150 ft. from W of lease, J. B. Wolfin Sur. | Washing to bottom; T.D. 1,884 ft. |

**DALLAS COUNTY**

| | |
|---|---|
| Paris' No. 2 Wilkinson, 2,787 ft. from NW and 3,241 ft. from SW of John P. Anderson Sur. | T.D. 1,330 ft.; S.D. |
| Joe Wilson's No. 1 fee, 600 ft. from N line and 600 ft. from W line of 1,500-ac. tract, John Scroggs Sur. | S.D. 483 ft. |

**DELTA COUNTY**

| | |
|---|---|
| Worthington et al's No. 1 Pejernett, 776 ft. from S and 150 ft. from W in E. Chick Sur., 1½ miles W of Horton | S.D. 3,315 ft. |

**ELLIS COUNTY**

| | |
|---|---|
| Clark Brooks' No. 1 C. W. Golliday, 300 ft. from S line and 300 ft. from E line of tract and survey, John Bones Sur. | Drlg. 1,760 ft. |
| E. M. Roger's No. 1 John Lee Winn, 1,650 ft. from E and 150 ft. from S of Orland, Orlo Wheeler Sur. | S.D. 1,435 ft. |
| Worthen Pet. Co.'s No. 1 Cerf, 2½ miles NE of Ennis. | T.D. 2,264 ft. |

**FANNIN COUNTY**

| | |
|---|---|
| Lucas Dev. Co.'s No. 1 R. Peeler, 175 ft. from E and 600 ft. from S lines of farm, F. L. Hart Sur. | S.D. 700 ft. |
| Ed. V. Parson's No. 1 Morgan, J. E. English Sur. | Fishing 3,959 ft. |

**FRANKLIN COUNTY**

| | |
|---|---|
| Tom Harper's No. 1 fee, 150 ft. from N line and 300 ft. from E line of 116-ac. tract, W. M. Dawson Sur. | Derrick. |

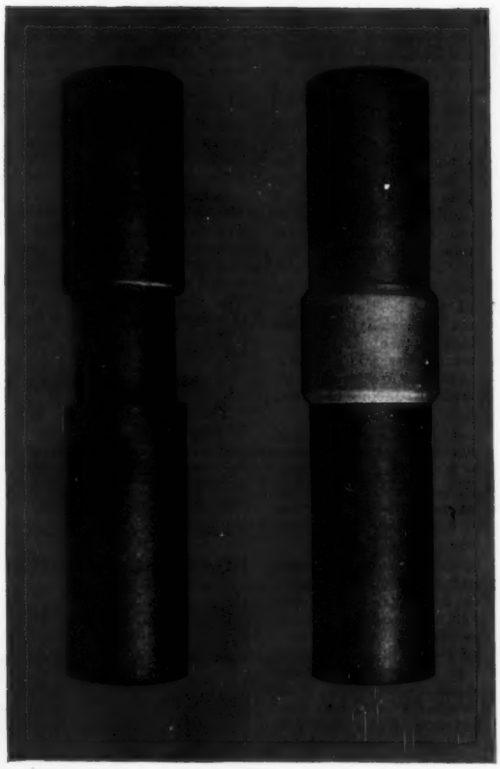
**GREGG COUNTY**

| | |
|---|---|
| Arkansas Fuel Oil Co.'s No. 1 C. L. Taylor, 295 ft. from N and S lines and 330 ft. from W line of E 21.94 acres of S 29.76 acres of 114.76-ac. tract, W. H. Castleberry Sur. | Derrick. |
| Atlantic & Pacific's No. 1 B. Robinson, 330 ft. from N and W lines of 68-ac. tract, S. Davis Sur. | S.D. 3,526 ft. |
| Ausley and Massingill's No. 1 A. Harris, center of 3-ac. tract, Gladewater Townsite, M. Dillard Sur. | Waiting on cmt. to set 3,540 ft. |

(Continued on Page 94)

# NOT ONE SLIP IN 9,000

**NINE THOUSAND BJ Anti-Friction Tool Joints have set amazing records for long life and satisfying performance. Out of nine thousand Bettis Protectors *anchored in these tool joints* not one "slip" has ever been reported. ● The use of Bettis Protectors to prevent metal-to-metal friction of casing and drill pipe is now standard practice in every field. A protector anchored in the tool joint gives longer life to both tool joint and protector.**



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# Pipe Line Construction News

## NORTHERN NATURAL GAS PIPE LINE PROGRESS

The Northern Gas & Pipe Line Co. has a total of 1,881 miles of pipe line, of which 1,796 miles are now in operation and 85 miles are under construction. Of the total mileage in operation, 978 miles are main lines and 818 miles are branch lines. This mileage does not include over 1,000 miles of distribution system lines within cities and towns.

Following is the total mileage by states: Nebraska, 652 miles; Kansas, 515 miles; Iowa, 415 miles; Minnesota, 100 miles; Texas, 78 miles; South Dakota, 69 miles, and Oklahoma, 47 miles.

Sixty-six miles of pipe line are now being constructed in Minnesota and 19 miles are now being built in Iowa.

Ninety-six cities and towns are now being served with natural gas furnished by the Northern Gas & Pipe Line Co. and 13 more are scheduled to be served this month, making a total in 1931 of 109. The cities and towns are located as follows: Nebraska, 61; Iowa, 27; Kansas, 15; Minnesota, 5, and South Dakota, 1.

Much of the construction work of the Northern Natural Gas Co. is now centered in Minnesota with activity by the Minnesota Northern Natural Gas Co.

The construction of the 16-inch main line to a short distance west of Owattona will be completed during the first part of next month.

The line to Rochester, which will supply natural gas to the municipal power plant and to the Franklin Heating Station which heats the Mayo Clinic and the Kahlor Hotels, is under construction and is scheduled for completion before the end of the year.

Distribution systems are now being built in Wells and Alden and will soon be started in New Richland, Dodge Center and Kasson, all of these towns to be served by the People's Natural Gas Co.

In Iowa, distribution systems are under construction in Glenwood, Boxholm and Pilot Mound, all to be served from the main line through the Iowa Gas Distributing Co. Audubon, Exira and Jefferson distribution systems were scheduled to be completed during December.

## PIPE LINE MEETING IN EAST TEXAS FIELD

KILGORE, Tex., Dec. 28.—A standing committee of oil men was named here today to solve the common problem in the East Texas oil field of providing pipe line connections for all wells. Small operators particularly are affected.

Selection of the committee was made after a meeting in military headquarters of 50 small operators and representatives of the pipe line companies. Brig. Gen. Jacob F. Wolters, martial law commander in the field, requested the meeting.

J. T. Clark of the Magnolia Pipe Line Co., Longview, was named general chairman of the committee. Subchairmen were named thus:

J. C. Hanrahan, Humble Pipe Line Co., Longview area; J. B. Alleman, Texas Pipe Line Co., Henderson, for Overton area; J. G. Pew, Sun Pipe Line Co., Dallas, for Troup area; W. C. Leish, Longview, for Kilgore area.

Members of the committee include D. B. Deaton, Stanolind Oil & Gas Co.; George Goad, Tidal Pipe Line Co.; H. L. Hunt, Panola Pipe Line Co.; L. H. Gray, Sun Oil Co.; C. M. Bryson, Toronto Pipe Line Co., and H. Hallander, Sinclair-Texas Pipe Line Co., all of Tyler.

One Oklahoman was named on the committee. He was A. M. Horne, Empire Pipe Line Co., Bartlesville, Okla.

## SPENT $426,700,000 ON PIPE LINES IN 1931

An estimate of 1931 construction of pipe lines in the United States received by the Oklahoma Utilities Association shows total construction of 16,468 miles of gasoline, crude oil and gas lines at a total expenditure of $426,700,000. Approximately 7,476 miles of gas lines were laid during this period at a total cost of $314,000,000. It is estimated that approximately 500 miles of such lines will be completed in or through Oklahoma by the end of the year. Among larger projects listed, which obtain their supply from the Texas Panhandle fields and cross Oklahoma, are the Panhandle Eastern Pipe Line Co.'s line, with 1,412 miles of construction, extending through Kansas, Missouri and Illinois to Indiana, at an estimated expenditure of $40,000,000; Continental Construction Co.'s line, with 1,256 miles of construction, extending to Chicago, at an estimated expenditure of $50,000,000 and the Northern Natural Gas Corp. line, with 355 miles of construction during the year, extending through Nebraska and Iowa, at an estimated expenditure of $45,000,000. There was also a 74-mile line constructed by the Panhandle Power & Light Co. from Dumas, Tex., to Boise City, Okla., costing $500,000.

### SHORT MICHIGAN LINE

The Peerless Oil Co. is completing a 15-mile 3 and 4-inch pipe line from the east pool in Midland County, Greendale Township, to St. Louis, Mich. The company will ship from St. Louis to refineries in Saginaw and Big Rapids, Mich.

## TEXAS IS ORGANIZING PIPE LINE DIVISION

AUSTIN, Tex., Dec. 28.—The Railroad Commission is preparing to organize its pipe line division which has been given enlarged powers and duties under the new laws regulating both gas and oil carriers.

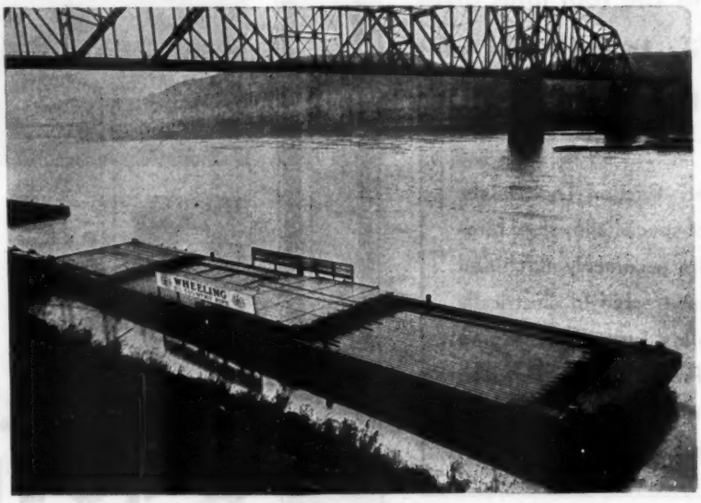
The commission hopes to have the organization perfected by January 1 and to see it start functioning early in the new year. The new duties contemplate the valuation of pipe lines and the fixing of rates as well as the enforcement of the common purchaser ratable clauses of the law. A director of the pipe line department will be chosen soon. Oil and gas pipe line rates now come within the jurisdiction of the commission but it has not exercised its rights to fix them, pending the completion of the new organization and the assembling of controlling facts.

A suit is pending in the Federal Court at Houston attacking as invalid that part of the gas pipe law that exacts common purchasing of gas by the pipe lines.

R. D. Parker, chief oil and gas supervisor, and Laten Stanberry, chief of the gas utilities division, have been instructed to form an organization to value the oil pipe lines and all gas pipe lines other than the Lone Star.

The commission and the Board of Control approved a contract whereby the Lone Star properties are to be valued by the Fort Worth firm of Hawley, Freese & Nichols on a per diem compensation basis with a maximum of $45,000.

## BOATS CARRY WHEELING PIPE FOR IDECO WAREHOUSES



Anticipating cold weather, the Wheeling Steel Corp. is hastening the movement of its oil country pipe down the Ohio River on barges from the corporation's pipe mill docks at Benwood, W. Va., and Steubenville, Ohio. The average barge is loaded with about 25 cars of pipe. The first tow left Steubenville recently.

These shipments are for the Mid-Continent warehouses of the International Derrick & Equipment division of the International-Stacey Corp. in accordance with arrangements recently announced, under which the Ideco group will sell Wheeling pipe, both welded and seamless, in the principal oil fields of the world.

The first shipments will be made to Memphis for the Wheeling warehouse at that point and will be used to replenish stocks already en route from Memphis to Ideco distributing centers. Other tows of sizable tonnage are expected to be forwarded shortly. If possible, direct water shipments will also be made to the Ideco pipe yards at Beaumont and Houston, Tex.

The entrance of the Ideco organization into the sale of the pipe in the oil country places another powerful competitor in the pipe distribution field.

In the arrangements with the Wheeling Steel Corp., Ideco will sell the full Wheeling line of tubular goods, which includes both welded and seamless pipe, as is required for the production divisions and refineries of the oil industry.

## OPERATING PIPE LINES WITHOUT ACCIDENT

By J. P. Sutton
Ohio Oil Co.

Excellent rules of procedure have be laid down for the guidance of field m but I fear few of those who should re this literature ever see it. I mean, t ones who manage and work at pipe li operations are not usually privileged attend safety meetings nor are they fu nished good discussions to read.

The mechanics of pipe lines and t machinery and tools have been great improved these last few years, but t knowledge about men has not made su progress as could be desired. I have doubt but that men in charge of pipe li construction and operation know far be ter than safety men the proper practic (they may not do as well as they know in securing right of way, surveying rig of way, clearing right of way, diggi ditch, blasting ditch, stringing pipe, la ing pipe, testing pipe, filling in ditc and finally operating the pipe lines a carrying out their company's policie such as good housekeeping, and low co of operation which includes accident pr vention. In most cases their knowled comes from the hard school of experien and it is usually a rich one, but becau they have been around dangers all their work life, they may have becom hardened to them and really do not s hazards with the same eyes as a safe man. They are usually reasonable fe lows and when the safety man or supe visor points out dangerous practices conditions existing, they usually respo to a sensible suggestion. The safety m is essentially a suggestor and there great power in a suggestion when ta fully given.

It has been brought to our attenti many times that the key to accident pr vention, as well as profit returns to company is the foreman. I agree th the foreman is a very essential cog the wheels of industry, but I can blame him for everything that goes wro I am convinced that accident preventi is as much a duty of management as is the duty of the foreman and worke I believe it is the duty of manageme higher up, rather than the foreman, build a capable organization, but si we agree a foreman is a very essenti cog in carrying out the policies of ma agement in an organization, why do m companies have more capable foreme I can only blame management, becau they select and appoint foremen, usual from the ranks and oftentimes witho careful consideration as to whether th have the qualifications necessary.

### LINE INTO MEXICO CITY

The petroleum pipe line connecti Mexico City with the Gulf oil fields Tuxpam, Vera Cruz, will be ready f use by the middle of next month.

This pipe line is said to pass the hig est point of any in the world, as it climb up more than 10,000 feet to enter t valley of Mexico.

It will feed the British Eagle refine at Atzcapozalco, Mexico City suburb which is now being completed. The co struction cost about 10,000,000 pes and was started two years ago. It the first pipe line into Mexico City.

### WASHINGTON PERMIT REFUSED

CHATHAM, Ontario, Dec. 28.— project for an international gas pipe li to connect Montana with British C lumbia has been halted by the refus of the Washington State Highway Co mission to grant a permit to D. E. Lam representing unnamed interests, for line from the southern state boundary British Columbia.

# QUALITY EQUIPMENT FOR ECONOMICAL OPERATIONS IN 1932

Out of the crucible of any great crisis come truths stripped to bare and obvious essentials. In the Petroleum Industry the sheer magnitude of operations and frequent requirement for quick completion has sometimes led to hasty buying. In 1932 the atmosphere will have been cleared. Men will buy for permanence, efficiency, economy; the demand will be for equipment manufactured by established and responsible concerns. The QUALITY PRODUCTS of the manufacturers listed below are available to the Oil and Gas Industry through our organization.

### AXELSON

ucker Rods; Pull Rods; Plunger Working Barrels Pumps); Sutffing Boxes, etc.

### BEAUMONT

readnaught Water Cooled Drawworks; Timken Bear-g Equipped Crown, Traveling and Tubing Block; umping Hoists; Bailing Line Reels; Steel Walking eams; Casing Shoes; Anchor and River Clamps; itmans; Flow Line and Christmas Tree Fittings. Self ontained Pumping Units, Tubing Heads.

### DONOVAN

il Country Boilers and Tanks. Boilers range from w pressure to 350 pounds W.P., for the deepest drill-g demands.

### JONES & LAUGHLIN

Tubular Goods—Buttwelded, Lapwelded and Seamless in Line Pipe, Casing, Drill Pipe and Tubing.

### RATIGAN

"SURE-GRIP" line of pumping equipment including Grips, Clamps, Beam Hangers, Rod Elevators, etc.

### REID

Gas Engines, two and four-cycle; Band Wheel and Direct Drive Pumping Powers; Receiving Boxes and other refinery equipment.

### ROEBLING

Wire Line; Gas and Electric Welding Wire.

### ROSSENDALE

"Camel Hair" and Stitched canvas belting.

### WALWORTH

Fittings, valves and tools for Oil, Gas, Air, Water and Steam; Sigma Steel Drilling Gate Valves; Flow Line and Refinery Valves.

### WHITLOCK

Manila Cordage, Drilling Cables, Bull Ropes, Cat Lines, etc. Either Waterflex or Plain.

# FRICK-REID SUPPLY CORPORATION

PITTSBURGH, PA. TULSA, OKLA.

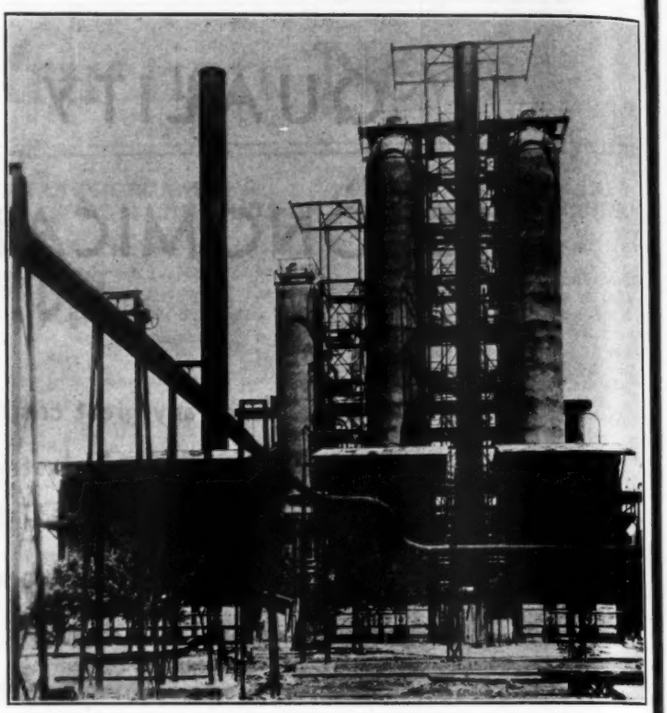
.... AND BRANCHES

With Stores conveniently located from the Rocky Mountains to the Atlantic Coast

# Soviet Refineries Include Units of Modern Design and Large Capacities

* * * * * * *

**During the past year Foster Wheeler Corp. has completed and put into operation more than 20 complete distillation units in foreign countries. In addition there are several more units now under construction and complete tubular heaters have been supplied for cracking and topping operations. The largest single unit and the largest battery of units erected abroad were both installed for the Soviet Oil Trusts. These units were sold to the Amtorg Trading Corp., American purchasing agents of the Soviet, and were erected in Russia under the supervision of the company's engineers. All the labor, together with erecting tools and rigging were supplied by the two Russian Oil Trusts.**



*Two two-stage topping units operating at the Batum refinery.*

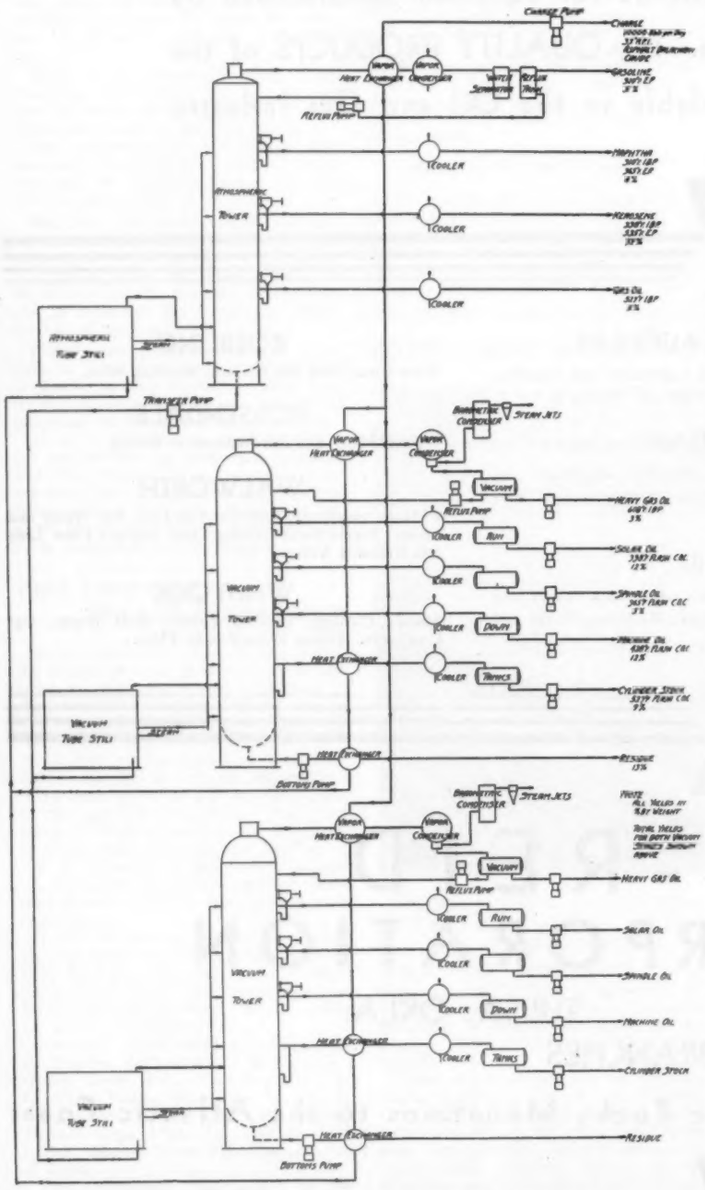
* * * * * * *

In all, six complete refinery units were installed. The first was a 15,000-bbl. per day topping unit erected at Grozny for Grozneft. The second unit was a 4,400-bbl. per day two-stage crude unit running the lubricating stocks. This unit was also erected at the Grozny refinery. The next units to go into service were three 10,000-bbl. topping units erected in a single battery at the Batum refinery of the Azneft, the largest of the Russian Oil Trusts. About two months after this battery was put on stream the sixth unit was ready for operation. This was a two-stage unit designed to run 10,000 bbls. per day to overhead lubricating stock. It was erected at the Batum refinery near the three topping units.

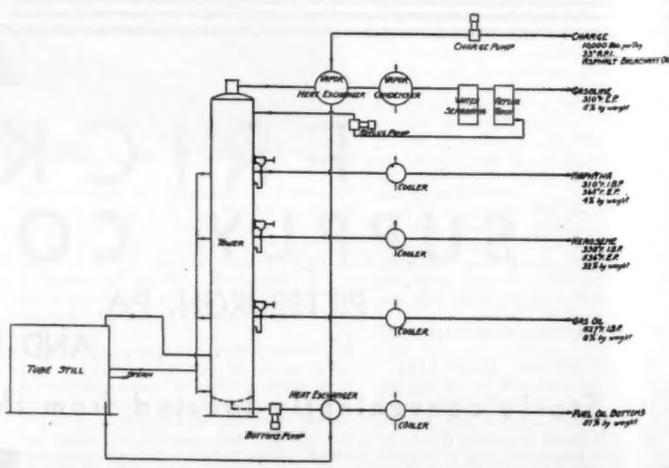
The 15,000-bbl. topping unit at Grozny is the largest single unit abroad, as far as can be determined. In design, however, it is similar to numerous other units of its kind. Crude is preheated in heat exchangers utilizing the heat of the overhead vapors, and then passes to a settling tank. Leaving the settling tank, it is further preheated before entering the tube still and there the temperature is increased sufficiently to vaporize about 45 per cent of the charge. Products covered in the tower include gasoline as overhead vapors, three liquid side streams, including naphtha, kerosene and gas oil, and a fuel oil residuum.

The two-stage unit at Grozny is the second Foster Wheeler two-stage unit being erected abroad, the first being located in Japan. This unit was erected by the same engineers who supervised the erection of the topping unit and was completed about 60 days later. The towers were assembled on the ground and were hoisted into position with three winches made up of spliced logs. Each of the three winches was turned by four horses. The gin poles used in the hoisting were also made up of the spliced logs.

Asphaltic base crude is charged at the rate of 4,400 bbls. per day. It is preheated by heat exchangers in the gasoline vapor line and then must pass to a settling tank as is necessary in the single stage unit. Leaving the settling tank, the crude is further heated in heat exchangers by the side streams of vacuum stage before being delivered to the atmospheric tube still. From this tube still the oil flows to the atmospheric




*Flow chart of the two-stage topping unit at Batum.*




*Flow chart showing the operation of the three 10,000-bbl. topping units erected in a single battery at the Batum refinery for the Azneft.*

Anti-knock value is important, certainly, but let's not be stampeded

It is true, today's automobile engines don't like straight-run gasoline because it knocks

But they don't need a fuel of fantastically high knock rating either

Dubbs cracked gasoline is made to suit today's automobile engine and it does

Octane number far above present needs is easy for the Dubbs cracking process if you want it But why make it beyond useful need?

Dubbs cracking can meet any anti-knock standard—today or tomorrow—at a profit

Universal Oil Products Co
Chicago Illinois

Dubbs Cracking Process
Owner and Licensor

tower. Gasoline is recovered as overhead vapor and naphtha, kerosene and light gas oil as liquid side streams. The residuum from the atmospheric tower is pumped to the vacuum tube still where it is further heated before being delivered to the vacuum tower. Products recovered from the vacuum tower include heavy gas oil as overhead vapors, spindle oil, machine oil and motor oil as liquid side streams and heavy asphalt as residuum. Process steam used for stripping within the towers is superheated in the tube stills. This steam is the exhaust from steam driven pumps.

The patented weir type control valves on both units at Grozny are of the external type and are applied to all of the liquid side streams with the exception of the motor oil cut from the vapor tower of the two-stage unit. Once these weirs are set for a given set of specifications they need no further adjustment in as much as the top tower and tube still outlet temperatures control the products thereafter.

Before the units at Grozny were completed work was started on the topping units at Batum. These three topping units constitute the largest single battery of topping units of this kind in any foreign refinery. Their operation, which is very similar to the 15,000-bbl. topping unit is shown in the accompanying flow chart. About the only difference in the general design of the two units is the elimination of the settling tank at Batum due to the better grade of crude charge. The Batum units also remove a slightly higher percentage of the charge as overhead product than the Grozny unit.

The most interesting of the six Russian units is the two-stage unit at Batum, a picture of which is included here. This unit, although a two-stage unit, includes three fractionating towers. One tower operates under atmospheric pressure and the other two towers operate in parallel under high vacuum. The unit is designed to charge 10,000 bbls. per day of asphaltic base crude received from the Balachny Field. Except for the omission of the settling tanks, the operation as shown by the accompanying flow diagram is similar to the smaller two-stage unit at Grozny described previously.

About 46 per cent of the charge is fractionated into final products in the atmospheric stage and the balance is delivered to the two vacuum stages. On account of the large volume of vapor under high vacuum, a single tower which would handle the entire residuum from the atmospheric stage would have been much larger than could be conveniently shipped to Russia, and installed there without extensive construction tools. For this reason the vacuum stage was divided into two sections with a resultant decrease in the size of parts and decrease in erection cost.

Another advantage of the two parallel vacuum stages is the flexibility they give to the unit. It is possible to operate the two vacuum stages independently, obtaining products of different specifications from each stage. This permits operating the unit to produce the maximum yield and the largest number of marketable products. Under normal operation, however, the two vacuum stages will be operated to produce the same products.

Each vacuum stage is designed to deliver six different fractions, including heavy gas oil as overhead vapor, solar oil, spindle oil, machine oil, cylinder stock as liquid side streams and a heavy asphaltic residuum as bottom.

## GEOLOGICAL SURVEY'S OIL AND GAS DIVISION

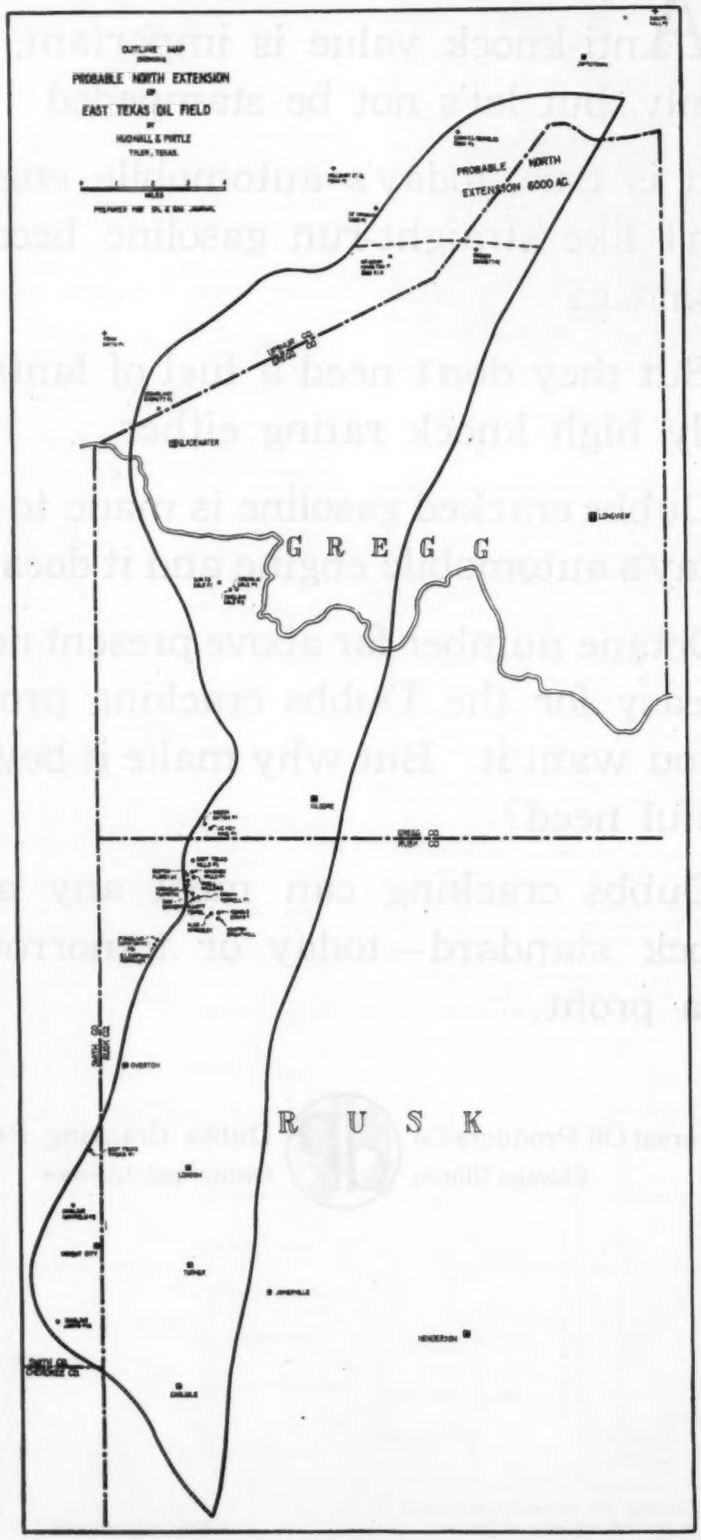
WASHINGTON, D. C., Dec. 28.—The Department of the Interior has created a new division designated as oil and gas leasing division in the conservation branch, separating oil and gas from mining. Hale B. Soyster, who has been supervisor of the mineral leasing division of the U. S. Geological Survey with headquarters in Casper, Wyo., will be chief of the new division and will report to Washington early in January. Until his successor has been appointed, J. H. Reeve will be acting supervisor.

# GEOLOGY OF NORTHEAST EXTENSION OF THE OIL FIELDS IN EAST TEXAS

By J. S. Hudnall

Perhaps no area in Texas offers so much interest to the geologist and economist as the northeast extension of the East Texas oil field. The attention to this important area was caused by the Holloway and others' No. 1 Penn, located 3 miles northwest of DeArmond's No. 1 Cobb, which was one of the water wells defining the northwest boundary of the pool. The Penn well encountered the top of a slightly saturated sand at a subsea level of 3,342 feet, and a water sand at 3,382 feet subsea. The interval between the two sands was shale and red bed. The top sand was encountered at an elevation of 50 to 100 feet higher than was expected.

Due to the Penn well running so high and the sand being encountered at a subsea level of 3,342 feet oil was expected to be found higher on the structure or farther east, the direction of regional rise in the Woodbine sand. The Cranfill & Reynolds' No. 1 Rash was well located to test out this theory.




Most geologists believed the Cranfill & Reynolds well had a good chance to produce due to the fact that it was expected to pick up the sand above water level (3,320 feet subsea). When the well had reached a subsea depth of 3,320 feet with no indication of the sand hopes for a producer rapidly faded as each core was taken. When the sand was at last reached at minus 3,375 feet or approximately 50 feet below water level it was expected to test water. The drill stem test showed 27 fourbles of oil and four of mud in a 10-minute test. The oil tested 33 gravity or 6° below the average of the field.

### Defined to Northeast

Since the testing of this well the Shasta Oil Co. and others have completed a dry hole on the Hall 73-acre tract, Richard Gibson Survey, located 6½ miles northeast of the Cranfill & Reynolds test. The Shasta well encountered a show of oil and water at minus 3,434 feet. This well picked up the pay considerably lower than was expected. It clearly defines the field to the northeast.

The Cranfill & Reynolds test showing oil and no water at minus 3,375 feet on top of the sand has caused considerable speculation. There are three theories prevalent among geologists as to the meaning of this test. First, the well may be producing from the same sand as the main pool and tilting to the north since accumulation has carried the oil below water level. The oil has not adjusted itself to the new structural position. DeArmond's No. 1 Cobb suggested this condition since it did not encounter any water till it reached a minus 3,355 feet.

Second, the Cranfill & Reynolds well may be on a separate structure which would likely lie northwest of the well in the direction of the Kelsey high.

Third, the Cranfill & Reynolds test may be showing oil from a higher lense of sand from that found in the main pool. In the Gladewater area and other parts of the main pool there are two distinct sands with a red bed break between the two members. The upper member does not usually carry water. Many believe that the lower sand originally had all the oil and it has migrated to the upper sand from the lower at some point east of the Cranfill & Reynolds test, where the two lenses came together and at an elevation above the 3,320-foot subsea level. This theory predicates a producing area lying east of the showing which would likely connect directly with the main pool.

Of the three theories above advanced the first seems most plausible. There may be a combination of the three theories.

### Significance of the Northeast Extension

The drilling of Shasta's No. 1 Hall has more definitely defined the northeastern limits of the field. The significant part of the test is that it had some saturation, indicating that production will likely extend to within 3 miles of the well.

The Cranfill & Reynolds' test may or may not make a large producer but it strongly suggests an extension of several miles.

## PRINCIPLES OF PATENT LAW

An unusually interesting book dealing with inventions and the essentials of patent law, by A. W. Deller, has been published by the Chemical Catalog Co., 419 Fourth Avenue, New York City, at $6. This book of 483 pages discusses patentable inventions, persons entitled to patents, principles of patentability, how to apply for a patent, infringement and commercial phases together with other subjects. Expensive mistakes and the loss of valuable rights often result from a lack of knowledge of patents. This book contains much technical information in a readable form that will serve as an excellent guide to all interested in inventions. It should be especially welcomed by chemists, research directors, managers and executives who have to consider patent problems.

# Is Your Refinery Running *at a Substantial Profit?*

When many refining departments are showing losses, refinery gasoline recovery plants are paying dividends! If you are operating cracking units and have no recovery plant, you are neglecting to turn a source of loss into a source of profit.

Let Black, Sivalls & Bryson Engineers show you how quickly such a recovery plant will pay for itself. Instead of burning good anti-knock gasoline as fuel under boilers and stills, run your refinery at a greater profit by salvaging the otherwise waste products of the hydrocarbons you may be losing with your present equipment. May we show you how you can strip your gas *entirely* of its valuable gasoline fractions in a modern Recovery Plant?

*Designing*
*Engineering*
*Fabrication*
*Erection*

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Eastern and Foreign Representative:
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# Oklahoma Prepares to Cut Production

## New Well in Oklahoma City Makes 6,392 Bbls. in 75 Minutes. Seek Permission to Drill Test Close to State Capitol

By W. A. Spinney
*Staff Correspondent, Oklahoma Fields*

The daily average crude oil production of Oklahoma was approximately 534,300 bbls. a day for the week ending December 26, or about 60,000 bbls. a day more than the new allowable which will become effective on January 1, when the State is permitted to produce 475,000 bbls. a day. The Oklahoma City Field continues to be the most active area in the State, and has been during the entire year. The Carr City Pool, in Seminole County, is second in activity.

Producers are preparing to curtail their daily production everywhere in the State for the first time. Only the flush areas have been prorated but after the first of the year all production in the State is to be curtailed. The pipe line companies have been ordered by the Corporation Commission to reduce their purchases 10 per cent in all areas not otherwise regulated.

Operators in the Oklahoma City Field are preparing to curtail the daily production to meet market requirements. The daily allowable from the Oklahoma City Field has been reduced to 160,000 bbls. a day and the pipe line companies in that field plan to hold their daily purchases to approximately 146,000 bbls. a day during the month of January. This amount was decided upon after a survey of the field had been made by the umpire's committee.

The current underproduction in the Oklahoma City Field is approximately 1,000,000 bbls. The pipe line companies plan to adjust their purchases so that all leases in the field will be ratably handled.

New locations were staked in the field during the week. These include Tom Slick Oil Co.'s No. 10 Classen-Edwards, SW cor. NE NW SW, Section 3-11-3w, and No. 11 Classen-Edwards, SE cor. NE SW, Section 3-11-3w; Phillips Petroleum Co.'s No. 1 Rousch, C S half SW SE NE, Section 10-11-3w; Skirvin-Whitfield's No. 1 on a small tract on Block 19 of Phillips-Meads Addition, the location being in approximately SE cor. SE NE SE, Section 34-12-3w.

### State's Allowable

The Oklahoma Corporation Commission reduced the State's allowable to 475,000 bbls. a day effective January 1 for the months of January, February and March. State Umpire Ray M. Collins estimates the amount of oil needed for these months to be: January, 482,680 bbls. a day; February, 481,045 bbls.; March, 524,567 bbls. He also said the potential production of the State outside of the Oklahoma City Field was 601,000 bbls. a day. One of the umpire's staff said the Oklahoma City Field had an adjusted potential of 3,215,996 bbls. a day; this would give the State a rated potential of 3,816,996 bbls. a day. The stripper, or unprorated, areas of the State have an estimated potential of 148,234 bbls. a day for January, according to Mr. Collins. In February the potential would be around 143,853 bbls. a day, and in March approximately 139,463 bbls. a day. The Class "A" wells, with a 20-bbl. a day marginal and 50 per cent proration over that amount, have a potential in January of 41,266 bbls. a day, February 40,647 bbls. and March 40,037 bbls.

The last half of the week in the Oklahoma City Field was quiet as many of the oil companies' employes were granted a holiday from Thursday, December 24, to Monday, December 28. Only necessary work was resumed on Saturday and the pipe line shipments and the daily production was expected to be at a low figure.

The umpire's office at Oklahoma City expects to have the allowables and percentages fixed under the new law ready for companies to start in at once on the new schedule. The pipe line companies expect to have their allocations ready by the time the order is effective.

### Tremendous Producer

Another huge gusher was tested during the week in the Oklahoma City Field. The well is the Marshall Oil & Gas Co., Wilcox Oil & Gas Co. and others' No. 1 Buxton, SW cor. NE NW Section 3-11-3w. It was reported to have flowed 6,392 bbls. of oil in 1 hour and 15 minutes before it cut the connections. The well has the 9-inch casing landed at 6,331 feet and the total depth is 6,482 feet. It was flowed wide open and is believed to be the first well in the field with 9-inch pipe to flow without chokes of some kind. The well was completed December 15 and flowed 1,548 bbls. of oil the first hour with an estimated 45,000,000 feet of gas.

### New Potentials

New potential gauges were taken at the Capitol Producing & Refining Co.'s No. 1 Refinery, NE cor. SE Section 4-11-3w, under the authority of a special order of the Corporation Commission. It flowed 2,506 bbls. of oil in four hours. It previously had a potential of 717 bbls. of oil in two hours, and had been given an adjusted potential of 2,699 bbls. for 24 hours. The gas was estimated at 20,000,000 feet a day. When the previous potential test was attempted in November the well bridged several times.

Denver Producing & Refining Co. and others' No. 1 H. Smith, NE cor. SW SW NW Section 3-11-3w, flowed 2,646 bbls. of oil in two hours while finishing its initial potential test. It previously tested 1,422 bbls. of oil in one hour. The well is producing through 9-inch casing landed at 6,395 feet. It was produced through a choke from a total depth of 6,523 feet.

Phillips Petroleum Co.'s No. 1 Burt has been given an adjusted potential of 5,214 bbls., which is a 25 per cent reduction from the previous potential. Blackwell Oil & Gas Co.'s No. 1 Patterson has been given an adjusted potential of 7,771 bbls. a day. Other adjusted potentials after making tests include Cromwell-Franklin Oil Co.'s No. 28 Trosper-Park, 3,252 bbls.; Indian Territory Illuminating Oil Co.'s No. 1 Worley Heights, 571 bbls.; No. 4 Spillman, 39 bbls. a day; No. 1 Jennings, 291 bbls.; Government Petroleum Co.'s No. 1 Government, 2,330 bbls.

### Would Drill Near Capitol

A test may be drilled within 2,500 feet of the state capitol at Oklahoma City, and would be the only one in the vicinity if the city planning board approves of the permit to J. F. Harn. The planning board and the city council of Oklahoma City have been asked to pass on an application to permit the drilling of an oil well on the J. F. Harn tract which is just southwest of the state capitol.

The tract comprises about 100 acres and is bounded on the east by Lincoln Boulevard, and on the west by the Santa Fe right of way, on the south by East Sixteenth Street and on the north by a 60-acre tract of state land. It is planned to drill only one well on the 100-acre tract on the extreme west side, about 300 feet east of the Santa Fe Railway right of way.

It is proposed to have the remainder of the tract restricted from further drilling so there would be only one well on the land. No offsets could be drilled to the well as the adjoining area is restricted.

The application states in the event the test is a gas well the production will be offered to the city at 3 cents per 1,000 feet until the cost of the drilling has been paid and then the well will be presented to the city. Should it be an oil well, the operator will derive the full benefits.

Wirt Franklin Petroleum Corp. had a lease on the tract a few months ago and attempted to get a drilling permit, but was defeated by joint action of the property owners and the city commissioners.

The daily average production of the Oklahoma City Field during the last few weeks has been exceeding the daily allowable and since the allowable for the State has been reduced effective January 1, a large quantity of storage oil may be left on the leases.

### Leasing Transactions

While other sections of the State are quiet, leasing of acreage in the Oklahoma City area continues active and there has been an increase in royalty transactions in the outlying sections in Oklahoma County. The area most active is in the vicinity of the Mid-Kansas Oil & Gas Co. and others' No. 1 Messer, Section 32-14-3w, located west of Edmond. Some express the opinion this area may be developed in the spring of 1932; some of the operators recently have extended leases in the area and have shown new signs of resuming work.

Reports of recent leasing in the county include the following: Gypsy Oil Co. has leased the E half NW, Section 24-12-1w; Carter Oil Co., the W half SE NE, Section 12-12-4w; Continental Oil Co., the N half SW, Section 12-12-4w; Anderson-Prichard Oil Corp., Block 24 of Milam Northwest Highland Addition, in Section 7-12-3w.

The Prairie Oil & Gas Co. has been working on titles in Townships 17-1 and 17-2 northeast of Guthrie in Logan, Payne and Lincoln Counties. Tom Slick Oil Co. has assigned its block of leases in these townships to the Prairie Oil & Gas Co. The Slick interests drilled two tests wells on the block several years ago and found a showing of oil and gas.

Prairie Oil & Gas Co. has assigned a group of leases to Wirt C. Franklin with the consideration that a test well will be drilled in the NW cor. SW, Section 23-23-5, Pawnee County.

Payne County has been active from a leasing standpoint and the county has been undergoing a geophysical survey which has resulted in the leasing campaign. Recent transactions include the Mid-Kansas Oil & Gas Co. leasing the half NE, Section 27-19-6, and part of the NE, Section 26-18-4. The Empire Oil & Refining Co. has leased several tracts in the county, the NW, Section 3-19-4, and N half, Section 4-19-4. Producers & Refiners Corp. leased the 3 acres in the SE NE, Section 33-18-5.

The Carr City Field in Seminole County is an active district. Work has been revived in the field with nine new tests drilling. It is expected that this work will stimulate the entire Greater Seminole area. Several companies are reconditioning old producers while others are considering drilling up their leases. A survey of the district indicates that there is considerable territory yet to be developed. With some of the companies in need of oil production it is believed that the development will continue until spring.

Field work also shows an increase in Pontotoc County, with the majority of the work in the Beebe district. The pay horizon is found at a shallow depth and there is a demand for the crude locally. Six wells are drilling in the county.

### In the Fish Pool

Several of the recent operations in the Fish Pool, located along the boundary line of Hughes and Seminole Counties are nearing the pay horizons. It is believed that additional locations will be made after the first of the year. Some of the operations in the area include Producers & Refiners Corp.'s No. 1 Newcomb, NW cor. SE SW Section 9-7-8, which was spudding. Mid-Continent Petroleum Corp.'s No. 1 Brunner, NE cor. NW SE Section 9-7-8, found sand at 2,900-37 feet, and landed the 6-inch casing at 2,895 feet, and was rigging up standard tools before drilling into the pay.

Burke-Greis Oil Co.'s No. 1 Catlett, SW cor. Section 20-7-8, was standardizing at a total depth of 3,065 feet. Jarvis & Holm's No. 1 Fish, NE cor. NW NE Section 30-7-8, has landed 6-inch ca

(Continued on Page 87)

## WILDCAT OPERATIONS IN OKLAHOMA

**NORTHERN OKLAHOMA**

**ALFALFA COUNTY**

| Company, farm and location— | Remarks: |
|---|---|
| Smith Brothers' No. 1 Forbes, SE cor. NW NW, Sec. 13-27-11w | S.D. 1,283 ft. |
| J. W. Bailey's No. 1 Acre, SW cor. NE Sec. 14-24-11w | S.D. 5,502 ft. |

**ATOKA COUNTY**

| | |
|---|---|
| Campbell's No. 1 Baird, NW NE SW Sec. 31-1-13 | Rig. |
| Edgerton Edwards' No. 2 Rowland, SE NE NW Sec. 6-1-15 | Rig. |

**BECKHAM COUNTY**

| | |
|---|---|
| Price-McFann's No. 1 Webster, C SW SW Sec. 34-8-26w | T.D. 2,344 ft; plugged back to 1,890-1,900 ft; 1,500,000 ft. gas. |
| Mid-Continent's No. 1 Schaff, C NE SW Sec. 22-11-23w | Waiting on cmt. to set 430 ft. |
| Mid-Texas Co.'s No. 1 Sidell, NE cor. SW SW Sec. 17-2-22w | S.D. 2,550 ft. |
| White et al's No. 1 Green, SW cor. Sec. 34-10-24w | S.D. 2,575 ft. |

**BLAINE COUNTY**

| | |
|---|---|
| Washoma Oil Co. et al's No. 1 Phillips, C NW SW Sec. 13-19-10w | S.D. 5,115 ft. |

**CADDO COUNTY**

| | |
|---|---|
| Abernathy & Brown's No. 2 Houston, Sec. 24-6-13w | S.D. 1,115 ft. |

**CHEROKEE COUNTY**

| | |
|---|---|
| La Piere et al's No. 1 Woods, C SE SE Sec. 27-17-21 | S.D. 1,504 ft. |

**CLEVELAND COUNTY**

| | |
|---|---|
| Schemerhorn et al's No. 1 Bourland, NE NW SW, Sec. 1-6e-1 | Spudding. |

**COAL COUNTY**

| | |
|---|---|
| Radial Oil Co.'s No. 1 McGraw, NE NW Sec. 2-1s-8 | Drlg. 1,450 ft. |
| McCraw Oil Co.'s No. 1 Ward, NE SE Sec. 35-1-8 | Drlg. plug; showing 2,000,000 ft. gas 1,765-1,846 ft; mudded off gas; S.D.; rig moved. |
| Whitney et al's No. 1 Miller, SE NE Sec. 10-2-8 | S.D. 760 ft. |

**COMANCHE COUNTY**

| | |
|---|---|
| G. W. Stogner's No. 1 Dosbel, C SW SW Sec. 3-3-5w | S.D. 1,450 ft. |

(Continued on Page 80)

# New Proration Orders in Kansas Pools

## Ellsworth-Barton Arch Area Placed on a 40-Acre Unit Basis. Voluntary Curtailment Suggested in Other Pools

By W. A. Spinney
*Staff Correspondent, Kansas Fields*

Kansas' crude oil production in the week ending December 26, shows a decline of approximately 2,500 bbls. a day from the previous week. The estimated daily average production was 105,000 bbls. The decline was mostly in Sedgwick County.

Officials of three companies, Magnolia, Derby and Shell, producing in the Eastborough and Voshell Pools, promised cooperation with the Kansas Public Service Commission's proposal for a voluntary 40 per cent reduction of production in those pools. The Eastborough Pool, in Sedgwick County, and the Voshell Pool, in McPherson County, are producing around 10,000 bbls. of oil a day each. The two pools are not under proration.

The Kansas Public Service Commission issued new proration orders December 24, establishing each 40-acre tract as a unit for allowable production in the Silicious lime areas in Barton, Rice, Stafford and Ellsworth Counties, in the west central part of the State. The order supplemented the one recently set aside by the commission, which limited the drilling of new wells in the same counties to one on each 40 acres.

The new order of the commission provided that the basis of allowable production should be the average of the potential production of all the wells drilled on a 40-acre unit. One of the commissioners explained that under the order the allowable production would be the same regardless of the number of wells drilled on the tract.

The area is now prorated on a basis allowing 20 per cent production of the potentials. The order specified total allowable production from the Silicious area should be based upon pipe line and loading rack bona fide nominations of purchasing companies.

The order says that the drilling of an oil or gas well within 330 feet of any property line of the land belonging to another is prohibited, without the written permission of the commission.

The commission also retains jurisdiction to make such rules and further orders in the premises as may be necessary to provide for the prevention of waste and prevent the inequitable and unfair taking of oil.

### Covers W'de Area

The area covered by the new order includes the Barton Arch where more than a dozen new one-well pools have been found during the last two years.

The commission also stated that if a tract is less than 40 acres the allowable production shall be in the proportion which the acreage in that tract bears to 40 acres.

The total allowable production of the Silicious lime areas under consideration, shall be based upon the pipe line and loading rack outlet, provided however, that the nominations of the purchasers do not discriminate against the producers of oil in other pools in the State.

Practically all the oil found in the counties comes from the Silicious lime around 3,300 feet. Many of the operators expressed the opinion that the oil was being forced by water pressure and that it was necessary to produce the oil in an orderly manner, or the water may ruin the production.

Marileen Oil & Gas Co. purchased the one-fourth interest of J. W. Stark and G. W. Moore in the lease on which is located L. E. Cress and others' No. 1 Sharpe, SE cor. NE, Section 13-20-10w, Rice County, which is estimated at 1,500 bbls. a day from the Silicious lime at 3,318-38 feet. The purchase includes a quarter interest in the well. Others interested in the property are G. W. Hinkle, with a one-half, and L. E. Cress, a one-quarter interest in the 80-acre lease. The well is located about 3 miles northeast of the Schurr Pool, where the discovery well was completed in September, 1929.

The Derby Oil Co. is preparing to start another test on the Barton arch in the southwestern part of Ellsworth County. A location has been made for No. 1 Stratman, NE cor. NW NE, Section 12-17-10w, a quarter of a mile south of J. A. Alyward and others' No. 1 Stratman, in Section 1-17-10w, which is estimated at 2,500 bbls. a day.

### Stanolind Makes Connection

Since the Stanolind Crude Oil Purchasing Co. has made some connections to wildcat wells along the Barton arch during the last few weeks, it is expected new operations will be announced early in January. All of the wildcat wells which have been completed in Rice, Stafford, Barton and Ellsworth Counties, with the exception of those in the Schurr Pool, in Rice County, have been shut in awaiting a pipe line outlet.

An interesting wildcat in the southwestern part of Ellsworth County is expected to drill into the pay horizon in a few days. The test is the Barnsdall Oil Co. and J. H. Tatlock's No. 1 Schacht, SE cor. NW SW, Section 25-16-10w. It was underreaming the casing to the top of the Silicious lime found at 3,363 feet, where a showing of oil was also found. While drilling the test found a showing of gas at 3,010 feet and a showing of oil and gas at 3,070-80 feet.

Allison-Fitzwilliam Petroleum Corp. and others' No. 1 Stratman, C SW SE, Section 23-16-10w, Ellsworth County, gauged 4,500,000 feet of gas a day from 3,093-96 feet. The test may be drilled deeper to the Silicious lime.

Producers & Refiners Corp.'s No. 2 Thompson, SW cor. SE NW, Section 21-20-10w, a recent completion in the Schurr Pool, in Rice County, was gauged and given a potential of 1,620 bbls. of oil a day.

### New Work in Sedgwick

New tests were announced during the week for the Wright Pool in Sedgwick County. These two operations are the first to be drilled there in more than two years. The discovery well was completed in the field in August, 1928, No. 1 Wright, with an initial production of 1,700 bbls. a day, and after producing approximately 250,000 bbls. of oil was abandoned as an exhausted oil well last week. The new tests are being drilled to define the western and southern limits of the field. Continental Oil Co.'s No. 1 Bishop, NE cor. Section 13-26-1w, is three locations south of the discovery well in the field. The other test is Gypsy Oil Co.'s No. 1 Lambe, NE cor. NW Section 12-26-1w, nearly a half mile west of production on the west side of the field.

The chairman of the Kansas Public Service Commission, in a letter to producers in the Eastborough Pool, in Sedgwick County, said it was the commission's opinion that the output of the field should be reduced to an allowable of 60 per cent of the potential. An order curtailing the field 40 per cent is expected to be announced in a few days. The Eastborough Pool, is making approximately 10,000 bbls. of oil daily from 45 completed wells.

The operators with production in the Voshell Pool, in McPherson County, were also notified that the production would be curtailed 40 per cent of the potential. The Voshell Pool has been averaging around 10,800 bbls. a day.

It is the commission's hope that it will not be necessary to curtail production of these two pools longer than 90 days, believing that in April, 1932, the allowable output of the State of Kansas would be increased to approximately 135,000 bbls. a day. Kansas production after the first of January is to be limited to 100,000 bbls. a day.

In view of the fact that both the Voshell and Eastborough Pools make considerable water, the majority of the operators may protest against a curtailment order.

### Deeper Drilling

Several chat producers are being drilled deeper in the Eastborough Pool to the Viola lime formation. These include Derby Oil Co.'s No. 5 Eastborough, in Section 19-27-2, which was drilling at 3,125 feet. Derby Oil Co.'s No. 3 Eastborough, in Section 19-27-2, was drilling at 3,266 feet. Same company's No. 4 Eastborough was drilling at 3,185 feet. National Refining Co.'s No. 2 Murdock, in Section 18-27-2, was drilling at 3,100 feet. E. B. Shawver's No. 1 fee, in Section 18-27-2, was drilling at 3,190 feet.

### Oil in the Hunton Lime

The discovery of oil in the Hunton lime in the northwestern part of Harvey County is of considerable importance because it is said to have been the first time that oil has been found in that formation in Kansas. The well is Frank Hollow and others' No. 1 Church acre, SW cor. NW, Section 20-22-3w, which made one flow of 40 bbls. of oil and swabbed 25 bbls. of oil an hour. The swabbing did not lower the fluid below 3,000 feet in the hole. The Hunton lime formation lies below the Mississippi lime and above the Viola lime. The oil showing was found at 3,507-11 feet. The owners estimate the well between 500 and 600 bbls. a day. The crude oil tests 44 gravity, corrected. The well is located on a one-acre tract and is the only lease the owners have in the vicinity. It is about 7 miles south of the Voshell Pool in McPherson County. Offsets to the discovery well are owned by Mid-Kansas Oil & Gas Co., Shell Petroleum Corp., W. C. McBride, Inc., and Stanolind Oil & Gas Co. The surprising fact that a group drilled a wildcat test on a one-acre lease is explained by the fact that

(Continued on Page 81)

## WILDCAT OPERATIONS IN KANSAS

(Descriptions are East unless marked otherwise)

| Company, farm and location— | Remarks: |
|---|---|
| **BARTON COUNTY** | |
| Syndicate Oil Co.'s No. 1 Boretz, NW SE SE, Sec. 3-18-12w | S.D. 3,464 ft. |
| Skelton Oil Co.'s No. 1 Ott, C SE SE, Sec. 16-19-14w | S.O. 3,225-28 ft; 3,304-10 ft. wtr. |
| McCool et al's No. 1 Tsern, NW SE NE, Sec. 12-20-11w | Show oil 3,313-29 ft.; pumped 600 bbls. per day. |
| **CLAY COUNTY** | |
| Crystal Oil et al's No. 1 Tivier, SW cor., Sec. 19-8-3 | T.D. 2,860 ft; abd; no sand records available. |
| **DICKINSON COUNTY** | |
| Severs et al's No. 1 Lavengood, NE SW, Sec. 13-13-2 | Drlg. 4,662 ft. |
| **ELLSWORTH COUNTY** | |
| Alyward et al's No. 1 Stratman, SE NW SE, Sec. 1-17-10w | Silicious 3,255-71 ft.; 117 bbls. 1 hrs.; shut in; estimated 2,000 bbls.; no pipe line connections. |
| Aladdin Pet.'s No. 1 Stoddenberg, C SW, Sec. 22-16-10w | Silicious lime 3,332-47 ft.; estimated 1,500 bbls. a day; shut in. |
| **FINNEY COUNTY** | |
| National Ref. Co.'s No. 1 Wells, C SW, Sec. 13-23-30w | Drlg. 2,600 ft. |
| **HARVEY COUNTY** | |
| Liggett et al's No. 1 Davis, SW SE NE, Sec. 7-24-1 | Drlg. 1,640 ft. |
| **KINGMAN COUNTY** | |
| Skelly Oil Co.'s No. 1 Miles, NE cor., Sec. 30-27-10w | 1,635-40 ft. 2,000,000 ft. gas; at 2,005-20 ft., 6,000,000 ft gas; at 1,132-42 ft., 3,000,000 ft. gas; showing oil 3,285 ft.; T.D. 3,441 ft.; S.D. estimated at 600 bbls. a day. |
| Panhandle Drlg. Co.'s No. 1 Wetherall, C SE NW SW, Sec. 20-28-10w | Rig. |
| **McPHERSON COUNTY** | |
| Twin Drlg. Co.'s No. 1 Farver, SW SE, Sec. 16-20-1w. | Drlg. 360 ft. |
| Shell Pet. Corp.'s No. 1 Johnson, SE SW SW, Sec. 25-19-3w | Drlg. 220 ft. |
| **MORTON COUNTY** | |
| Hydraulic Oil Co.'s No. 1 State Land, NW SE, Sec. 22-34-43w | T.D. 3,640 ft.; temp. abd. |
| **MORRIS COUNTY** | |
| Allender et al's No. 1 Wycoff, C SW SE, Sec. 5-17-7 | S.D. 105 ft. |
| Urschel et al's No. 1 Bersuch, NW SE NW, Sec. 10-17-7 | Fishing 915 ft. |
| Hankerson et al's No. 1 Cessman, SW SE, Sec. 24-16-9 | S.D. 2,625 ft. |
| **NORTON COUNTY** | |
| Richards et al's No. 1 Colby, Sec. 17-4-21w | Rig. |
| **OSAGE COUNTY** | |
| Briggs & Smith's No. 1 Wood, SE NW Sec. 21-14-15 | S.D. 2,058 ft. |
| **RAWLINS COUNTY** | |
| J. G. Durham et al's No. 1 Weaver, SE cor., Sec. 3-2-35w | S.D. 2,925 ft. |
| **RICE COUNTY** | |
| Cress et al's No. 1 Sharp, SE NE, Sec. 13-20-10w | Show oil 3,107-15 ft.; Silicious 3,-330-36 ft.; estimated 1,500 bbls.; shut in. |
| **RUSSELL COUNTY** | |
| T. Palmer et al's No. 1 Pasek, C SE Sec. 3-14-11w | R.O.G. |
| **RUSH COUNTY** | |
| Dewey & Mitchell's No. 1 Greenawalt, C SW, Sec. 17-19-14w | Show of oil in Conglomerate 3,835-80 ft.; plugged back to 3,825-40 ft.; estimated 150 bbls.; S.D. |
| **SALINE COUNTY** | |
| Twin Mounds Oil Co.'s No. 1 Weis, C W½ NE NW, Sec. 20-13-4w | S.D. 2,710 ft. |
| **SHERIDAN COUNTY** | |
| Flo et al's No. 1 Shoemaker, SE SW, Sec. 27-7-26w | Drlg. 4,020 ft. |
| **STAFFORD COUNTY** | |
| Rosenthal, Stanolind and Amerada's No. 1 Gray, C NE, Sec. 11-24-11w | Show oil 3,839-41 ft.; drlg. 3,841 ft. |
| **STEVENS COUNTY** | |
| Argus Prod.'s No. 2 Christopher, C NE, Sec. 10-33-39w | S.D. 5,521 ft. |
| **SUMNER COUNTY** | |
| Tighe et al's No. 1 Thieson, C NW SE SE, Sec. 32-34-2 | S.G. 2,808-15 ft; S.D. |
| Trees Oil Co. and Shell's No. 1 Springate, NE SE SW, Sec. 6-34-2 | Drlg. 2,560 ft. |
| Spencer et al's No. 1 Penwell, NW SE NE, Sec. 16-3-3 | S.D. 4,384 ft. |
| **WASHINGTON COUNTY** | |
| Sincox et al's No. 1 Penwell, NW SE NE, Sec. 16-3-3 | S.D. 1,720 ft. |

# Floods Slow Up Activity in Arkansas

## Gas Wells Feature Completions in Mississippi, Arkansas and Louisiana. Three Failures in Zwolle Area

By J. R. Crumpton
*Staff Correspondent, Louisiana-Arkansas*

SHREVEPORT, La., Dec. 28.—This division experienced a rather quiet week, due principally to continued heavy rains which have made the roads almost impassable and flooded streams running through and adjacent to the fields. The Christmas holidays have also contributed to the inactivity during the past week. Due to high water in South Arkansas, especially in the Smackover Field, several hundred wells have been affected, causing a decline of over 3,000 bbls. in the daily average from that state.

A total of nine completions were reported from three states, the only commercial wells all being gassers. The Richland Field of North Louisiana reported one successful completion, the Southern Carbon Co.'s No. 6 Rosengrant & Ducomb, Section 19-17-6, gauging 15,840,000 feet of dry gas from a total depth of 2,440 feet. The rock pressure registered 800 pounds. The other gas wells were from the Jackson Field of Mississippi, two in number, with the Hinds County area furnishing one and Rankin County, on the east side of Pearl River, reporting the other. In the former county Ferguson, Fuller and others' No. 1 Sours and others, Section 34-6n-1e, had an initial flow of 43,019,000 feet of gas from 2,437 feet. The top of the chalk was encountered at 2,432 feet. The Rankin County area's hot spot in Section 12-5n-1e reported a good gasser with the completion of Muse & Muse's No. 1 Seany with an estimated initial flow of 35,000,000 feet from a total depth of 2,391 feet.

### Failures at Zwolle

The Zwolle Field recorded three failures out of as many completions to draw a blank as far as new production was concerned. The Exchange Petroleum Co.'s No. 1-B Louisiana Long Leaf Lumber Co., Section 35-8-11, was dry and abandoned at 2,657 feet. In Section 35-8-12, 6 miles west of the Exchange test, W. F. Lacey's No. 1 Holliday encountered salt water and was abandoned at 2,524 feet. The Pelican Natural Gas Co.'s No. 12 Louisiana Long Leaf Lumber Co., Section 4-7-11, was abandoned as dry at 2,547 feet. The Union Parish area of the Monroe gas field of North Louisiana reported a failure, after obtaining several nice gas wells recently. The Stovall Gas Co.'s No. 2 Howard, Section 32-20-3e, had salt water and was abandoned at 2,399 feet. A wildcat in Bienville Parish, the Arcadia Drilling Co.'s No. 1 Mason, Section 28-18-6, was the third test in this immediate vicinity to be found dry in the upper Nacatoch formation during the past year. The test was abandoned at 2,251 feet, with the top of the Nacatoch at 2,188 feet. These tests have been drilled and financed by local business interests of Arcadia and Gibsland, two municipalities of North Louisiana. The other duster was reported from Dallas County, Arkansas, a wildcat listed as E. C. Brewers' No. 1 Hillman, Section 20-10-13, and which has been temporarily abandoned during the last 10 months. The same operator with associates are now operating in this section as the Zepp Oil Co. and a new location has been made for No. 3 Hillman in the same section.

The chief interest in North Louisiana tests continues to center in the Loring Oil Co.'s No. 18 Bowman-Hicks, a deep test in Section 15-7-12 in the Zwolle Field. This well encountered a strong gas blowout after penetrating 4 feet of cap rock from 4,371-75 feet. As 33 feet of salt water sand had previously been penetrated, the hole is now standing full of salt water, after stopping the gas flow with baroids and heavy mud. Arrangements are being made to core the formation directly under the cap rock before setting casing. The regular production in the Zwolle Field comes from the chalk rock around 2,400 feet, and the recent showing of the new test has given rise to the belief that a regular producing horizon will be uncovered in some of the lower pay zones.

### May Extend Field

A possibility of a half-mile western extension of the extreme western part of the field which has centered around Section 1-7-13, loomed during the week with the results obtained in Smitherman & Grigsby's No. 1 Martinez, Section 2-7-13. Six-inch casing was set in the test at 2,037 feet at the top of the Zwolle marl where a good show of oil and gas was obtained. Other drilling operations in the Zwolle area of Sabine Parish follow: O. J. Baird's No. 1 Duggan, Section 14-7-11, set 6-inch casing at 2,410 feet; R. L. Gay, trustee's No. 1-A Long Bell Lumber Co., Section 10-8-13, a wildcat test several miles northwest of production, is drilling in lime and shale at 4,135 feet. This test is also being watched closely, as it is the second deep test for this area and has already had several good showings of oil and gas. Operations in this well will be rushed to reach the depth of the gas show in the Loring Oil Co.'s Bowman-Hicks. The Gerhig Oil Co.'s No. 1 Skinner, a wildcat north and east of production, in Section 16-8-11, seems to have made a failure with a dry test at a total depth of 2,777 feet. The well is now shut down waiting orders at that depth and at this writing it is not known whether the hole will be deepened. In Section 1-7-13 of the western extension, Smith and others' No. 1 Hale, after being swabbed for several days, has failed to make a flowing well and is waiting for standard rig to pump.

No other wildcats have developed anything of interest during the week, with the possible exception of the Plain Dealing Oil Corp.'s No. 1 Nattin, Section 15-22-14, in the northwestern part of Bossier Parish. This test has been standing with several hundred feet of oil in the hole since a partial completion last July at a total depth of 2,882 feet. At that time, 11 feet of sand was cored from 2,871 feet to the total depth, which resulted in a flow by heads of from 5 to 10 bbls. of oil daily after 4½-inch casing was set at 2,870 feet. Operations have recently been renewed on the test and it is now being swabbed in an effort to increase the flow. In Union County, Arkansas, the Lion Oil Refining Co.'s No. 9-A Hayes, a deep test in Section 4-16-15 of the Smackover Field, is still shut down on account of high waetr. This test now has a total depth of 7,255 feet with the drill bit in rock salt. Wilson & Chapman's No. 1 B. Hadley, Section 3-18-13, in the Urbana Field, is not having the success of previous wells drilled by these operators in this northern extension. Several hundred feet of salt water with an equal amount of oil resulted from a test at 3,560 feet, and the hole was cored to 3,588 feet. The top of the sand in the test is reported at 3,548 feet, and the hole is being plugged back to test at that depth.

### Daily Average Runs

There was a decline of 1,575 bbls. in the daily average runs from the fields of North Louisiana and Arkansas during the week. The Smackover Field registered the greatest decrease due to many wells being shut in on account of high water. The daily average runs from the several pools were:

| | |
|---|---|
| **NORTH LOUISIANA** | |
| Caddo light | 5,985 |
| Caddo heavy | 1,760 |
| Cotton Valley | 420 |
| DeSoto and Red River | 2,100 |
| Elm Grove | 360 |
| Haynesville | 4,480 |
| Holly | 375 |
| Homer | 2,840 |
| Pleasant Hill | 350 |
| Sarepta-Carterville | 800 |
| Urania | 3,310 |
| Zwolle | 4,765 |
| Total North Louisiana | 27,535 |
| Total previous week | 27,890 |
| Decrease | 355 |
| **ARKANSAS** | |
| Champagnolle | 2,040 |
| El Dorado | 3,260 |
| Lisbon | 560 |
| Nevada | 1,100 |
| Smackover light | 2,880 |
| Smackover heavy | 21,780 |
| Stephens | 670 |
| Urbana | 760 |
| Total Arkansas | 33,040 |
| Total previous week | 34,260 |
| Decrease | 1,220 |
| Total both states | 60,575 |
| Total previous week | 62,150 |
| Decrease | 1,575 |

## WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Rotary operations unless otherwise designated)

**NORTH LOUISIANA**

**AVOYELLES PARISH**

Company, farm and location—Remarks:
Stauffer & Eshleman's No. 1 Caruth, Sec. 40-1n-7e.....Derrick.

**BIENVILLE PARISH**

Arcadia Drlg. Co.'s No. 1 Mason, Sec. 28-18-6, 1,200 ft. W, 190 ft. N, SE cor. NE NW.....Dry and abd. 2,251 ft.

**BOSSIER PARISH**

Andrews & Davlin's No. 1 Nattin, 100 ft. N, 250 ft. W, C, Sec. 15-22-14.....Swbng. 2,890 ft.
Dr. W. N. Hankin's No. 1 Newell, 300 ft. S and W, NE cor., Sec. 12-19-11.....S.D. 1,710 ft.
D. L. Perkins' No. 1 Ardis & Co., 1,127 ft. N, 198 ft. E, SW cor., Sec. 13-15-11.....S.D. 1,004 ft.

**CADDO PARISH**

Louana O. & G. Co.'s No. 1 Hammock, Sec. 32-19-6, 660 ft. N and W, SE cor. .....Rigging up.

**CALDWELL PARISH**

Carter Bell's No. 1 Taylor, 150 ft. S, 150 ft. E, NW cor. NE SE, Sec. 17-14-4.....S.D. 110 ft.
Hudson et al's No. 1 Burton, Sec. 25-12-2e.....S.D. 2,950 ft.

**CATAHOULA PARISH**

National Drlg. Co.'s No. 1 Marsh McMiller, 70 ft. N, 100 ft. W, C, Sec. 26-9-6.....T.A. 3,097 ft.

**DE SOTO PARISH**

E. T. Oakes' No. 1 R. H. Bryant et al, 200 ft. N and W, SE cor. NE NW, Sec. 30-13-15.....S.D. 3,035 ft.
Rellitt Oil Co.'s No. 1 Ganno hrs., 300 ft. S and E, NW cor. NW NE, Sec. 12-11-16.....S.D. 1,965 ft.
A. R. Smith's No. 1 Horn, Sec. 15-12-16, NE cor. Sec. ..Rigging up.
Walters-Nicholson, tr.'s No. 1 Jim Guy, Sec. 2-11-13....S.D. 1,266 ft.

**MOREHOUSE PARISH**

United Gas Public Service Co.'s No. 2 Sandidge, Sec. 11-20n-4e, 656 ft. S, 1,332 ft. W, NE cor. NW.....Set 6-in. 2,128 ft.

**NATCHITOCHES PARISH**

Dr. H. S. Gerson's No. 1 Smith, Sec. 11-10-8, 2,000 ft. N, NE cor. of irregular Sec. 10 in Sec. 11.....Blowing wild; 3,000,000 ft. gas, 7,000 bbls. S.W. 585 ft.
Cooper et al's No. 2-A Cooper, C SE SE, Sec. 32-11-10..S.D. 1,518 ft.

(Continued on Page 79)

## LOUISIANA-ARKANSAS PROVEN AREAS

**NORTH LOUISIANA**

**CADDO PARISH—PINE ISLAND**

Company, farm and location—Remarks:
Shreveport Oil Corp.'s No. 2-B Muslow, 1,000 ft. S, 300 ft. E, NW cor., Sec. 32-21-15.....S.D. 2,135 ft.
Simplex Oil Co.'s No. 1 Youree-Glassell, 500 ft. N and E, C, Sec. 13-20-15.....S.D. 2,275 ft.

**CLAIBORNE—SUGAR CREEK AREA**

United Gas Public Service Co.'s No. 1 Dobbins, Sec. 12-19-6e, 1,186 ft. W, 700 ft. S, NE cor. Sec.....Set 9-in. 4,215 ft.

**MOREHOUSE PARISH**

Bahan & Bahan's No. 4 Feazel, 900 ft. W, 300 ft. S, NE cor., Sec. 2-20-4.....Location.

**OUACHITA PARISH**

Carbon Consolidated's No. 7 Guthrie, Sec. 50-20n-4e, 5,263 ft. N and 7,475 ft. W of cors. of Secs. 25, 26 and 49, in Sec. 50.....Location.

**RICHLAND PARISH**

United Gas Public Service Co.'s No. 1-B Colvin, Sec. 34-17-6, 657 ft. S, 754 ft. E, NW cor.....Set 6-in. 2,300 ft.
Southern Carbon Co.'s No. 6 Rosengrant & Ducomb, 2-640 ft. E, 1,980 ft. N, SW cor., Sec. 19-17-6.....Completed for 15,840,000 ft. gas 2,440 ft.

**SABINE PARISH—ZWOLLE**

Crescent Drlg. Co.'s No. 2 McCormick, Sec. 2-7-11.....Set 10-in. 100 ft; drlg. 175 ft.
Lyons & Neely's No. 1 McClanahan, Sec. 14-7-11, SE cor. SE NW.....Set 6-in. 2,402 ft.
W. F. Lacey's No. 1 Holliday, Sec. 35-8-12, 330 ft. N and E, SW cor. SE NW.....S.W. and abd. 2,524 ft.
Ohio Oil Co.'s No. 13 Bowman-Hicks, Sec. 35-8-12, 2,310 ft. N, 525 ft. W, SE cor. Sec.....W.O.S.R. 2,514 ft.
Pelican Nat. Gas Co.'s No. 11 La. Long Leaf Lbr. Co., Sec. 10-7-11, 330 ft. N and W, SE cor. NE NW.....1,000 ft. oil in hole 2,592 ft.
Pelican Nat. Gas Co.'s No. 12 La. Long Leaf Lbr. Co., Sec. 4-7-11, 330 ft. N and W of SE cor. Sec.....Dry and abd. 2,547 ft.
Smith et al's No. 1 Hale, Sec. 1-7-13, 330 ft. S and W, NE cor. NW SE.....W.O.S.R. 2,065 ft.
A. F. Tarver's No. 3 Cutrer, Sec. 12-7-11, 330 ft. S and W, NE cor. NW NW.....W.O.S.R. 2,550 ft.

(Continued on Page 79)

# ALCO

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# New Field in Gulf Coast Is Extended

## Thompson Pool in Fort Bend County Gets Fifth Consecutive Good Well From Deep Sand. Two Good Producers in Louisiana

By Neil Williams
*Staff Correspondent, Gulf Coast Fields*

HOUSTON, Tex., Dec. 28.—Operations generally over the Gulf Coast have been at a standstill since Thursday with the bulk of drilling shut down for the Christmas holidays. However, before the suspension of work developments of the week were marked by a half mile southward extension of deep sand production at the new Thompson Field, Fort Bend County, and the addition of two more good producers in the north extension area of East Hackberry, Cameron Parish, Louisiana.

The extension at Thompson (Lockwood or Clear Lake as it is designated by some operators) was effected by Cullen & West and Gulf Production Co.'s No. 1 Hampil, trustee (J. H. P. Davis), which came in estimated good for 3,000 bbls. daily from sand 5,284-5,386 feet. This is the fifth consecutive good well which has been brought in from this deep sand and already proves an area extending from this well on the south to the same operators' Nos. 2-A and 3-A Lockwood & Sharp, the present northernmost wells, 1¼ miles north.

Developments of this deep sand, which has followed more or less unfavorable operations in a shallower sand, has resulted in the building up of a daily output of nearly 10,000 bbls., making the field one of the largest producing fields on the Gulf Coast next to Barbers Hill and Refugio. Possibility that the field is to receive another substantial extension, 800 feet to the north, is indicated in Gulf Production Co.'s No. 1 Mary Booth Meyers, which at latest report was to test a sand shale showing oil at a total depth of 5,074 feet. This well is due north of Cullen & West's No. 2-A Lockwood & Sharp, which is on an east and west line with No. 3-A, these at present being the northernmost wells of the field. Gulf already has made location for No. 2 Mary Booth Meyers, which is 600 feet due east of No. 1, and due north of Cullen & West's No. 3-A Lockwood & Sharp.

Cullen & West's No. 1-A Lockwood & Sharp, discovery well of the Thompson Field, killed itself Tuesday night after blowing wild for a week. This well, which was originally completed last June in sand at a total depth of 3,087 feet and which was drilling deeper to the new lower sand, blew out while at a total depth of 4,807 feet. The gas, which was accompanied by considerable water, is believed to have come from a sand around 4,500 feet. The derrick and rig have been destroyed and the well now is standing.

### New Production in Louisiana

In the north extension pool of the East Hackberry Dome, 6,500 bbls. of new flush production was added the past week with the completion of Calcasieu Oil Co.'s No. 30 Watkins and J. G. Sutton's No. 1 Irwin. The former well in the sand at a total depth of 3,022 feet flowed initially at the rate of 4,500 bbls. daily on chokes while the Sutton well at a total depth of 3,008 feet made 2,000 bbls. daily. These are two of a series of prolific wells which have been brought in in rapid order in this new area, which already proved itself as the most productive spot on the dome so far. The pool is approximately a half mile to the north of the flank sand production, which was developed during the latter part of 1927 and through 1928 and 1929. The new pool, opened within the last several months, is in a sand overlying the dome at a depth of around 3,000 feet. The latest producers are the deepest so far in the sand. This is in contrast to the 3,900-foot horizon, the shallowest of the flank sands.

Mills Bennett Production Co.'s No. 6 Wilburn failed to prove up a new shallow Miocene sand on the east side of the Barbers Hill Dome when it swabbed salt water with 43 feet of 4-inch screen set at 3,970 feet. Screen has been pulled and the hole is being deepened to the 4,400-4,500-foot Miocene horizon, in which active development has been under way for the past several months. No new locations were made the past week in this play, but a dozen rigs are being kept active.

One completion was made at Barbers Hill with the bringing in of McAlbert Oil Co.'s No. 1 Wilburn, deep sand well, flowing 400 bbls. of pipe line oil daily, 65 pounds pressure through a three-eighths-inch choke, from sand at 5,173-97 feet. This is an old well deepened from 5,080 feet, where it formerly was completed as a producer.

### Two Small Wells

Two other small wells, one at Vinton and the other at Saratoga, made up the list of Coastal completions during the week. At Vinton, Vinton Petroleum Co.'s No. 1 Matilda Gray, an old well deepened to a lower sand at 3,214 feet, was put on the pump for 10 bbls. daily. Rio Bravo Oil Co.'s No. 124-A Cotton, Saratoga, pumped 50 bbls. daily in shallow sand at 518 feet.

Louisiana Gas & Fuel Co.'s No. 2 Minor, a wildcat in Terrebonne Parish, Louisiana, failed to make a satisfactory test in sand at a total depth of 3,882 feet. After drilling plug at 3,878 feet, the well showed salt water and an estimated 50,000 feet of gas daily. Casing now has been recemented for another test. In a drill stem test of the 4 feet of sand several weeks ago an estimated production of 2,000,000 feet of dry gas was shown. This wildcat, 3,480 feet south and 1,980 feet east of the NW cor., Section 3-18s-16e, is on a large geophysical block about 7 miles southwest of the town of Houma and about 15 miles northwest of the old Houma gas field.

Pure Oil Co.'s No. 6 Lost Lake, deep test on the extreme west flank of the Lost Lake Dome drilled into anhydrite topped at 6,169 feet and now is coring deeper in the cap with a view to drilling through and possibly back into formation again. This test is approximately 2,400 feet southwest of No. 5, which found a broken and irregular condition in the cap and salt indicating an "overhang." Being farther out from the center of the dome, No. 6 might be able to drill through the cap and find a productive underlying sand. By the drilling into cap in these tests, Lost Lake is being proved one of the largest domes in area on the coast. No. 5 finally was abandoned in salt at a total depth of 7,471 feet.

### Locate Another Wildcat

Location has been made by Brown and associates for No. 1 Todd, another wildcat for the Cheek district in central Jefferson County. This test, in the northwestern part of the William Carr Survey, is approximately 2 miles to the west of Humble Oil & Refining Co.'s No. 1 Nelson in the William Rice Survey which was abandoned as dry at 6,537 feet. Geophysical exploration over that part of Jefferson County has indicated a salt dome but there has been considerable speculation as to the exact location of the prospect. Humble failed to find any indication of a dome in its test.

Gulf Production Co. at latest report was drilling at 6,925 feet in its No. 4 McFaddin, which now is the deepest level so far reached on the east flank of the Moss Bluff Dome. In view of deep dry holes drilled on other sides of the dome and disappointing results in shallower sand on the east flank, the Gulf test probably will be watched closely. The only production, excepting one small shallow well, so far at Moss Bluff has been on the east flank from a sand around 5,600-5,800 feet, but in this, although a number of tests have been drilled only three have been completed as producers of mediocre importance.

Strake Oil Co.'s No. 1 South Texas Development Co., southeast of Conroe, Montgomery County, and completed several weeks ago as a gas well and the first production of any kind in Montgomery County, still is standing shut in pending arrangements for an outlet for the gas and the "gasoline" fluid which it makes. As yet no additional locations have been made and in general nothing new has developed in that area.

The Texas Company has been moving in separators and tanks to its No. 3 McFaddin, a wildcat in southwestern Victoria County, lower coastal country, which has been standing cemented on a sand showing considerable high gravity oil. The sand is at 5,827-32 feet and gives promise of opening a new field. It is anticipated that plug will be drilled and a test made early this week. In that district, Humble Oil & Refining Co. is reported to have acquired the Petty block of several thousand acres, situated on the north of the T. B. Slick estate block on which a wildcat gas well was completed early this year, and which in turn is some 3 miles to the north of the main drilling development so far. Humble's O'Connor block, on which a 2,000-bbl. oil well was completed early this month, opening a new field, is located to the south and west side of the district.

## GULF COAST FIELDS AND WILDCATS

Week Ending December 26
All Rotary

**BARBERS HILL—CHAMBERS COUNTY**

| Company, farm and location— | Remarks— |
|---|---|
| Mills Bennett Prod. Co.'s No. 6 Wilburn, Henry Griffith League, 135 ft. W of No. 5 in center of tract | Set 43 ft. of 4-in. screen 3,970 ft.; tested salt water; pulled screen and drillig deeper in sand 3,995 ft. |
| Mills Bennett Prod. Co.'s No. 5 Gulf-Fisher, Wm. Hodges Sur., 75 ft. from N line, 191 ft. W of No. 4 | Drlg. shale 3,105 ft. |
| R. E. Ferrell's No. 2 Wilburn, Henry Griffith League, 215 ft. W of No. 1 in center of 45-acre tract | Hard sandy lime 1,832 ft.; trying to get returns. |
| McAlbert Oil Co.'s No. 1 Wilburn (D.D.), Henry Griffith League | Sand 5,173-97 ft.; set 24 ft. of 4½-in. screen; comp. flowing 400 bbls. pipe line oil, ⅝-in. choke. |
| Nat Hunter Prod. Co.'s No. 1 S. E. Morgan, 225 ft. N of S line in center of Strip 2 (4.4 acres), Henry Griffith League | Drlg. shale and lime 4,830 ft. |
| Nat Hunter Prod. Co.'s No. 1 J. M. Fitzgerald, Henry Griffith League, 75 ft. from W line and 125 ft. from S line of tract | Drlg. salt 2,720 ft.; top of salt 1,409 ft. |
| Nat Hunter Prod. Co.'s No. 2 Iifrey (W.O.), Henry Griffith League, 250 ft. from E line and 30 ft. from N line | Drlg. shale and lime 5,110 ft. |
| Sinclair Oil & Gas Co.'s No. 9 Wilburn, Wm. Hodges Sur., 50 ft. N of S line and 550 ft. W of No. 6 | Drlg. sticky shale 4,323 ft. |
| Sinclair Oil & Gas Co.'s No. 10 Wilburn, Wm. Hodges Sur., 50 ft. S line, 100 ft. W of No. 9 | Drlg. sandy lime 3,788 ft. |
| Sinclair Oil & Gas Co.'s No. 11 Wilburn, Wm. Hodges Sur., 125 ft. W of No. 8 and 45 ft. S of N line | Drlg. salt 2,387 ft.; top of salt 1,423 ft. |
| Sun Oil Co.'s No. 2 Higgins, Wm. Bloodgood Sur., 1,095 ft. W of No. 1 and 50 ft. N of S line | Drlg. salt 2,757 ft.; top of salt 1,424 ft. |
| Sun Oil Co.'s No. 12 Wilburn, Wm. Hodges Sur., 50 ft. from N line and 75 ft. W of No. 11 | Drlg. sandy shale 3,973 ft. |
| Sun Oil Co.'s No. 2 Winfree (W.O.), W. D. Smith Sur., 50 ft. from SW line and 150 ft. of S line | Drlg. hard sand 5,451 ft. |
| The Texas Company's No. 2 Lawrence, Henry Griffith League, 240 ft. from E line and 412 ft. from N and S lines of strip | Drlg. hard lime and shale 4,931 ft. |
| The Texas Company's No. 8 Wilburn, Henry Griffith League, 25 ft. W of No. 5 and 50 ft. N of S line of tract | Spudded. |

**HUMBLE—HARRIS COUNTY**

| | |
|---|---|
| J. E. Burt et al's No. 1 C.O.&G.-Texas Co. fee, J. B. Stevenson Sur. | Sand showing oil 1,953-70 ft.; cem. 6⅝-in. casing 1,953 ft. |
| Sun Oil Co.'s No. 26 Bender, W. B. Adams Sur., 310 ft. W, 30 deg. N of No. 25 | Set 2 joints 4½-in. screen 3,489 ft.; comp. flowing 800 bbls. pipe line oil, 500 lbs. pressure, ⅝-in. choke. |
| The Texas Company's No. 37 Kochler, J. B. Stevenson Sur., 717 ft. E and 603 ft. S of NW cor. of SW fee tract | Drlg. hard sand 3,933 ft. |
| The Texas Company's No. 46 Stevenson fee, 1,630 ft. N and 1,690 ft. W of SE cor. of J. B. Stevenson Sur. | Drlg. shale 4,360 ft. |
| E. M. Wilson's No. 7 W. & P. Gulf fee | Cem. 10-in. surface casing 43 ft. |

**PORT NECHES—ORANGE COUNTY**

| | |
|---|---|
| The Texas Company's No. 1 Polk-Kuhn-Glass, 260 ft. E and 1,545 ft. S of SW cor. Marshall Beauchamp Sur., in the T. J. Notgrass Sur. | Drlg. sticky shale 4,285 ft. |
| The Texas Company's No. 2 Kuhn, 587 ft. S and 150 ft. W of NE cor. of the Mary E. Hall Sur. No. 2 | Location. |

**BIG CREEK—FORT BEND COUNTY**

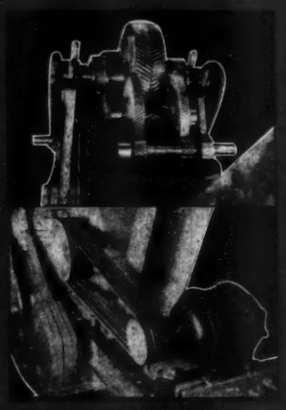
| | |
|---|---|
| Gulf Prod. Co.'s No. 62 Davis, M. Young Sur., 400 ft. NE of No. 19 and 600 ft. SE of No. 57 | Drlg. shale 3,756 ft. |

**HULL—LIBERTY COUNTY**

| | |
|---|---|
| Lincoln Oil Co.'s No. 1 Barrow, Jesse DeVore Sur., 50 ft. from N line and 31 ft. from E and W lines 37-acre tract | Rig. |
| Republic Prod. Co.'s No. 89-A Dolbear, Jesse DeVore Sur., 25 ft. W of No. 89 | Drlg. 2,104 ft. |

(Continued on Page 78)

# PUMP YOUR WAY TO GREATER PROFITS WITH IDECO TYPE "A-3" PUMPING UNITS



Ideco type A-3 Pumping Unit driven by gasoline engine through V belt drive.

Ideco type A-3 Pumping Unit driven by gasoline engine through V belt drive.

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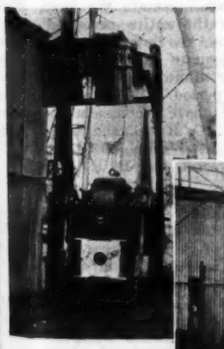
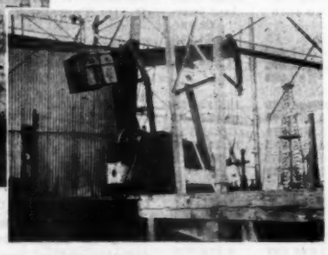


Ideco type A-3 Pumping Units installed on Continental lease at Long Beach, Calif.



This well 6300 ft. deep is pumping 112 barrels in 24 hours on a 51 inch stroke.

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# California Curtailment Order Opposed

## Some Long Beach Operators Refuse to Support New Program. Production Situation Regarded as Serious

By L. P. Stockman
*Staff Correspondent, California Fields*

LOS ANGELES, Calif., Dec. 26.—California's crude oil curtailment program is hanging in the balance due to the refusal of Long Beach operators to comply with the curtailment order of December 16, which contemplated the reduction of state production from a previous allowable of 487,500 bbls. per day to 456,700 bbls. per day until June 30, 1932. The flat refusal of many Long Beach operators has precipitated a serious crisis and one which may lead to a possible collapse of the entire curtailment program unless immediate drastic steps are undertaken. Under the order of December 16, the Operators General Committee on statewide curtailment recommended immediate compliance and had set December 21, as the dead line, on or before which state production was supposed to have been brought down to the new allowable. Practically every field in the State, with the exception of Long Beach, Santa Fe Springs, Playa Del Rey, Huntington Beach, Ventura Avenue and Rincon, were either below or very close to their respective allowables before the established dead line. The situation with respect to curtailment reached an acute stage later in the week and the ultimate status of the curtailment program remains to be seen.

The executive committee of the Oil Producers Sales Agency of California took a hand in the matter and definitely demanded a revision in the prescribed allotment and rated potential daily production established for several fields. In a letter sent to agency members the executive committee informed them that "From this report it appears that the program is not acceptable in many quarters (including both majors and independents) as it seems that the order is in many ways unfair particularly to the small producer and this inherent weakness is creating a condition bordering closely to a rebellion against the order. There is no question in the minds of your officers and the executive committee that curtailment of some kind is essential for the welfare of the oil producers but we believe it will be necessary to revise the present order so that it will be enforceable and more fair in its treatment. Therefore in order to prevent a possible collapse of curtailment in the State of California this letter is being addressed to you with the idea that in the interim between now and the time when this order may possibly be revamped and reconsidered by the State General Curtailment Committee that our members hold their production to their allowable under the old December order of 487,500 bbls. We are informed that the purchasing companies will accept this oil up to the first of the year and in fairness to our members we feel that they should be placed in a position to protect themselves at least to this point."

### Effect on Price Structure

The seriousness of the present situation is quite obvious in view of the fact that the Pacific Coast price structure will break if the existing curtailment program collapses. The present difference of opinion and unwillingness of producers to effect additional curtailment is particularly unfortunate as an upward revision in price schedules had been anticipated early in 1932. It appears quite probable that crude oil curtailment in one form or another will be continued although its effectiveness may be minimized because of the failure of producers to mutually curtail production.

The present critical status of the curtailment program is causing leaders of the industry considerable anxiety because they recognize the inability of purchasing companies to store any substantial quantity of petroleum during the first half of 1932. Conservationists are striving to adjust the existing differences of opinion and are hopeful of ultimate success. It is quite evident in view of the above that this is an opportune time to re-establish potentials and definitely determine just which operators are actually curtailing and those which are not. This test will likewise furnish the basis for an equitable curtailment in each and every field where there appears to be any inequalities. As far as can be seen, this appears to be the only solution to the existing problem unless the Operators General Committee on statewide curtailment fails to support the engineering committee's report.

Two diverging trends of thought are quite prominent in the criticism of the new allotments established by the curtailment committee. This is of particular interest in view of the fact that the rules committee in order to clarify the situation recently laid down a uniform procedure to be followed in determining potential production. This committee in a rather lengthy report reaffirmed its belief "in the principle originally developed; that the potential production of a well should be established as the average maximum daily production of that well under conditions of accepted normal operating practice for a period of 30 days. Average maximum production as used in the foregoing is taken to mean the estimated production resulting from the normal operation of the entire field or zone.

This committe further subscribes to the principle that in the pending review of potentials for the various fields of California each well should be treated strictly on the basis of facts, in so far as they are ascertainable, without regard to company position or other circumstances unrelated to the well's production. To correct inequities which may arise from the use of such a method this committee believes that a supplemental report setting forth these inequities and the reasons therefor should be submitted to the general committee together with specific recommendations for their correction.

### Committee's Principles

Six general types of potential determination are recognized: (a) Wells with established production which have been operating continuously for a period of time. (b) New completions and re-completions. (c) Wells which have been shut in for a period of time. (d) Wells of intermittent operation. (e) Producing wells tested to demonstrate doubtful potentials. (f) Wells used for gas or oil injection or shut in for the same purpose. This committee believes that the various classes of potentials enumerated in the foregoing paragraph should be considered in the following manner: (1) Wells of established production and continuous operation. This type of well should be judged on the basis of its production curve, operating conditions and the status of adjacent wells, and a potential should be assigned which will represent an estimate of the maximum capacity of the well at a specified date under the same operating conditions. (2) New completions and recompletions. The potential production of these wells shall be determined by a five-day production test witnessed and supervised by a representative of the oil umpire except that at the request of the operator the period of the flow test may be varied by the joint approval of the umpire and the potential committee. The potential assigned shall be the average of the last four days unless conditions indicate that such a figure is not a fair measure of the well's capabilities. In determining this potential the producing methods and facilities used must be the same as those subsequently employed or kept available, and such that the result shall be a normal instead of a "forced" potential.

(3) Shut-in wells capable of commercial production: Shut-in wells in fields or zones subject to competitive drainage shall be assigned a potential as indicated by the last recorded normal production and shall receive a decline which in the judgment of the potential committee is reasonable. Shut-in wells carrying a potential but which in the judgment of the potential committee are not capable of producing because of mechanical conditions or water encroachment shall receive no potential but at the option of the operator shall be placed on test under the supervision of the oil umpire for a sufficient length of time to demonstrate a true potential. Under the above classification, wells shut in for curtailment purposes with no mechanical difficulties may remove pumping equipment from the well without losing their assigned potentials. (4) Wells of intermittent operation: Potentials for wells of this group shall be determined on the basis of facts contained in the history of such wells. (5) Producing wells tested to demonstrate doubtful potentials: Demonstrative flow tests shall be conducted under production methods and with facilities which will yield a normal and not a "forced" potential, and such production methods and facilities shall remain available for regular production. The average rate established during a period of not less than five days of continuous production shall be the potential and the basis of allotment for the current period and will be subject to proper decline for subsequent periods. All demonstrative tests must be made under the supervision of the umpire and must be witnessed by his representative to be eligible for acceptance. (6) Wells used for gas or oil injection: Such wells shall be treated in the same manner as shut-in wells unless such wells are in areas of edgewater or are in such mechanical condition as to be incapable of producing. It is understood that injected oil produced under curtailment shall be classified as storage and shall not be considered in subsequent determination of the storage well's potential.

In all cases where operators have not furnished sufficient data for the correct estimation of potentials, the potential committees shall assign potentials consistent with the facts available, and such potentials shall remain the basis of allotment for the entire period. Potential revisions due to flow tests or because of more adequate data shall not become effective for allotment purposes until the succeeding period." The rules committee making the above recommendations consisted of A. C. Rubel, chairman; J. H. Menke, A. A. Jergins, D. L. Caldwell, R. R. Templeton and B. E. Parsons.

### Elwood

The Bankline Oil Co. added a new well to its list of producers in the Elwood Field of Santa Barbara County by completing well No. 5 on tideland permit No. 89, flowing 651 bbls. of unusually clean 34.5 gravity oil per day from 3,203 feet. The completion of this well leaves the Elwood Field with only two incompleted drilling projects under way at the present time. No further work is anticipated in this field until definite action has been taken on a proposed unification of future production and drilling activities below the present productive Vaqueros. If operators adopt the proposal to unitize future operations it is quite possible that additional deep zone development may be undertaken next spring. Drilling operations in the Ventura Avenue Field have been declining all year and present indications point to a further reduction in the amount of work to be undertaken during the next six months. There are only four drilling wells and a few reconditioning jobs occupying the attention of operators in this district at the present time. The Shell

**TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS**

| Commodity— | Total this week | Daily average | Total last week | Daily average | This year to date | Same time last year |
|---|---|---|---|---|---|---|
| Crude oil | ..... | ..... | ..... | ..... | ..... | 68,690 |
| Fuel oil | ..... | ..... | ..... | ..... | ..... | 71,950 |
| Diesel and gas oil | ..... | ..... | ..... | ..... | 1,566,803 | 3,936,796 |
| Gasoline | 194,800 | 27,829 | 592,389 | 84,627 | 13,098,675 | 18,837,373 |
| Kerosene | ..... | ..... | ..... | ..... | 187,934 | ..... |
| Coastwise— | | | | | | |
| Crude oil | 178,310 | 25,473 | 335,995 | 47,999 | 20,426,265 | 15,035,051 |
| Fuel oil | 447,723 | 63,960 | 451,119 | 64,446 | 13,652,878 | 18,487,583 |
| Diesel and gas oil | 5,704 | 815 | 34,586 | 4,941 | 1,451,879 | 1,630,122 |
| Gasoline | 347,576 | 49,654 | 262,596 | 37,514 | 14,162,725 | 12,443,325 |
| Kerosene | ..... | ..... | 7,281 | 1,040 | 318,362 | 166,262 |
| Naphtha distillate | ..... | ..... | ..... | ..... | 4,952 | ..... |
| Exports— | | | | | | |
| Crude oil | 10,076 | 1,439 | 86,516 | 12,359 | 6,963,391 | 6,909,175 |
| Fuel oil | 248,236 | 35,462 | 191,146 | 27,307 | 12,995,524 | 17,146,459 |
| Diesel and gas oil | 39,625 | 5,661 | 81,118 | 11,588 | 3,409,223 | 4,189,535 |
| Gasoline | 59,932 | 8,562 | 187,022 | 26,717 | 2,256,913 | 16,170,101 |
| Kerosene | ..... | ..... | ..... | ..... | 1,645,723 | 3,228,711 |
| Lubricants | ..... | ..... | ..... | ..... | 36,353 | ..... |

**TANKER SHIPMENTS, SAN FRANCISCO TO ATLANTIC AND GULF COAST PORTS**

| | | | | | | |
|---|---|---|---|---|---|---|
| Diesel and gas oil | ..... | ..... | ..... | ..... | ..... | 279,088 |
| Gasoline | ..... | ..... | 73,167 | 10,452 | 1,187,834 | 1,144,921 |
| Kerosene | ..... | ..... | ..... | ..... | ..... | 10,750 |
| Lubricants | ..... | ..... | ..... | ..... | 38,236 | 27,796 |
| Coastwise— | | | | | | |
| Fuel oil | 85,029 | 12,147 | 148,682 | 21,240 | 3,632,245 | 3,370,247 |
| Diesel and gas oil | ..... | ..... | 4,740 | 677 | 438,552 | 362,474 |
| Gasoline | ..... | ..... | 128,602 | 18,372 | 4,244,319 | 4,313,096 |
| Kerosene | ..... | ..... | 2,950 | 421 | 287,045 | 219,719 |
| Naphtha distillate | ..... | ..... | ..... | ..... | 49,780 | ..... |
| Exports— | | | | | | |
| Crude oil | ..... | ..... | ..... | ..... | 494,511 | 59,993 |
| Fuel oil | ..... | ..... | ..... | ..... | 1,589,358 | 1,106,402 |
| Diesel and gas oil | ..... | ..... | ..... | ..... | 606,231 | 539,646 |
| Gasoline | 95,481 | 13,636 | ..... | ..... | 4,474,039 | 4,104,365 |
| Kerosene | ..... | ..... | ..... | ..... | 914,099 | 593,097 |
| Lubricants | ..... | ..... | ..... | ..... | 35,693 | 33,579 |

Oil Co. will probably start one new well on the Taylor lease within the next few weeks as it only has one string of tools in operation in this field at present. No. 65 Taylor was given a preliminary production test during the early part of the past week but was killed after producing 935 bbls. as the cement plug put on bottom at 5,920 feet was ineffective in excluding bottom water. The crew from this well will be used in drilling No. 72 Taylor, which is rigged up ready for spudding. The Superior Oil Co. secured a satisfactory water shut off in the Bolsa Chica's No. 6 Hartman, a deep test at Ventura Avenue, and drilling has been resumed at 7,452 feet.

### Kettleman Hills

The Petroleum Securities succeeded in mudding off No. 1 Burbank, its discovery well in the middle dome of Kettleman Hills, a few days ago and the company will immediately undertake corrective work in order to eliminate the salt water which the well is producing along with the oil. It may require several weeks in order to effect a water shut off as it has not yet been definitely determined whether the water is bottom water or entering the hole above the oil zone. The gas from this well, incidentally, averages a little better than 1 gallon of gasoline to each 1,000 feet of natural gas. The Superior Oil Co. has started rig construction for a new well to be drilled on the Bolsa Chica's holdings in this area and actual spud is expected to be made early in the new year. The next well to be finished in the middle dome will be the Standard Oil Co.'s No. 6-29 V, which is at present rotating ahead in brown shale at 6,600 feet.

In the north dome, the Union Oil Co. has started building rig for No. 2 King in accordance with lease requirements, and this project should be making hole within the next 15 days. The Union has one well on this property producing 4,030 bbls. per day from 8,310 feet. The Standard has started rig construction for well No. 56-29 J, an offset to the Union's No. 2 King, and while both will begin making hole early in 1932, they will probably not be completed until September or October of next year, as these deep wells usually require from 8 to 10 months from spud to completion. The Kettleman North Dome Association, which is working on five incompleted drilling projects, will probably slow up development work early next year as it has just about drilled sufficient wells to protect its acreage from undue drainage.

### Dominguez

There were no completions listed in the Dominguez Field of Los Angeles Basin during the past week and no new wells are expected until after the new year rolls around. The Union shut in Nos. 25 and 26 on the Callender lease on October 19 and pinched back No. 14 Hellman, a recent completion, from 4,120 bbls. to 1,810 bbls. In order to accomplish this, the bean was reduced from sixty-six-sixty-fourths-inch to twenty-eight-sixty-fourths-inch. No. 25 Callender was flowing 245 bbls. per day when shut in and No. 26 Callender 210 bbls. per day. The Shell effected a similar reduction in order to comply with the new curtailment program. The Associated has just about finished rigging up No. 11 De Francis, a projected deep test, and the bit should begin rotating ahead some time during the coming week.

Three new wells are scheduled for completion in the Playa Del Rey Field within the next 15 days and normal production is anticipated. These three potential producers are the Altadena Oil Co.'s No. 1 Venice, Herndon Petroleum Co.'s No. 4 Del Rey and No. 3 Venice of the Domestic & Foreign Petroleum. The Potrero Field will likewise show one or two completions early in 1932, although work in this field is rather limited in extent. In the Santa Fe Springs Field the Bellview Oil Syndicate is drilling ahead in No. 5 Grohs at 5,995 feet, and this well may bear watching as it is the present intention to carry it on down for a deep conclusive test. In the Inglewood Field, the E. K. Allison Syndicate is making preparations to make a production test on its No. 1, which field reports indicate has encountered a zone which may possibly be productive. No. 1 Sentous of the Baldwin Hills Syndicate is not yet deep enough to pick up the pay if the oil sand should extend under this property, as the bit in the hole has only passed the 3,000-foot level.

### Kern County

The Vedder Petroleum Co. has apparently discovered a new producing area west of the Mount Poso Field and north of the Kern River Field in Kern County. The productivity and extent of this new area is still problematical but, based on the production of the company's No. 2 McVan, which was brought in pumping 152 bbls. per day from 1,237 feet, several hundred acres may logically be expected to be productive. The oil tests 12.3 degrees and is quite similar in composition to the oil produced in the old Kern River Field. It is quite rich in lubricating stock and should make an excellent fuel oil as it has a high B.t.u. value. The Mohawk Petroleum has recompleted its No. 1 McDermott in the Fruitvale district of Kern County flowing 565 bbls. of 21.2 gravity oil cutting 15 per cent water. This well drilled into a gray water sand at 4,140 feet and was given a preliminary production test after being plugged back to 4,100 feet, from which point the well flowed 560 bbls. cutting 50 per cent. A string of 2½-inch tubing, with a packer, was run to 3,807 feet and the well finally completed a few days ago with the results just mentioned.

### Ventura County

The San Pedro Point Firmin Oil Co., controlled by a small group of investors, which drilled a dry hole in the Point Firmin area at Los Angeles Harbor several years ago and subsequently transferred its equipment to the Timber Canyon district of Ventura County, finished its first producer during the early part of the past week when its No. 2 Kellerman came in flowing by heads at the rate of 500 bbls. per day from 3,845 feet. This well, located at the foot of Santa Paula Ridge approximately 5 miles east of Ojai, where shallow production has been secured for a number of years, was spudded in about five years ago.

In the Sespe district of Ventura County, the Merchants Petroleum redrilled and deepened its No. 1 Cochran to 1,527 feet and recompleted it pumping 471 bbls. of unusually clean 23.8 gravity oil per day. This well, located in Section 1-4-20, has been temporarily taken off the beam as the limited lease storage was filled within the first few days. The Union Oil Co. has staked tentative location for a new well on the Calumet lease up in Shiells Canyon in Section 3-4-19, and rig material is expected to be placed on ground within the next few weeks. In the Simi Calabasas district, the Simi Oil Co. is making preparations to land a string of casing in its well No. 1, bottomed at 4,529 feet, preliminary to an early production test.

## VACUUM MOVES FROM HOUSTON TO DALLAS

HOUSTON, Tex., Dec. 28.—The first step toward the closing of the Houston divisional offices of the Vacuum Oil Co. and merging of the organization with that of the Magnolia Petroleum Co. following the recent merger of the Standard Oil Co. of New York and Vacuum Oil Co. as the Socony-Vacuum Corp. is being taken with the removal of Clyde M. Bennett, general manager of the Vacuum Oil Co. at Houston, and W. B. Sutton, head of the land department, from this city to Dallas. Mr. Bennett recently was elected a vice president of Magnolia Petroleum Co. and will assume his new duties there. At this time also most of the members of the accounting and purchasing departments also will be moved to Dallas.

No other changes have been definitely decided upon at this time but it has been made known that as quickly as arrangements can be made the remainder of the Vacuum personnel, including the land and geological and production departments, will be fitted into the Magnolia organization, either at Dallas or elsewhere. In the merger, all members of the Vacuum organization have been definitely assured that a place will be made for everyone. Approximately 60 employes of Houston are affected by the merger.

### IMPORTANT SOUTHERN CALIFORNIA WILDCATS

| Company, well and location— | S. T. R. | Depth | Status— |
|---|---|---|---|
| Hines Pet., No. 1 Ocean Park, Los Angeles Co. | 9- 2-15 | 7,414 | br. sh. drilling |
| Taylor Oil Co., No. 1 Culver, Los Angeles Co. | 12- 2-15 | 6,238 | suspended |
| Westwood Oil Co., No. 2 Hermosa, Los Angeles Co. | 6- 4-14 | 2,151 | suspended |
| Baxter Pet., No. 1 Hermosa, Los Angeles Co. | 5- 4-14 | rig | suspended |
| Staple Oil Co., No. 1 Manhattan, Los Angeles Co. | 24- 3-15 | 2,700 | suspended |
| Pacific Shore Oil Co., No. 1 Lawndale, Los Angeles Co. | 20- 3-14 | rig | suspended |
| Lawndale Pioneers, Inc., No. 1 Peck, Los Angeles Co. | 20- 3-14 | 5,100 | hd. sd. drilling |
| Mohawk Pet., No. 1 El Nido, Los Angeles Co. | 29- 3-14 | mtl. | building rig |
| Wilmington Consd., No. 1 Watson, Los Angeles Co. | 17- 4-13 | 1,012 | cleaning out |
| Ranger Pet. Co., No. 1 Watson, Los Angeles Co. | 28- 4-13 | 3,744 | to set pipe |
| Avalon Park Dev. Co., No. 1 Watson, Los Angeles Co. | 17- 3-13 | rig | suspended |
| Pedro Pet. Corp., No. 1 San Pedro, Los Angeles Co. | 14- 5-14 | rig | suspended |
| Brubaker, W. O., No. 1 Van Nuys, Los Angeles Co. | 11- 2-15 | 2,700 | suspended |
| Rucker & Croul, No. 3 Puente, Los Angeles Co. | 27- 2-10 | 2,200 | suspended |
| El Dorado Oil Co., No. 1 Puente, Los Angeles Co. | 30- 2- 9 | 2,250 | suspended |
| Cudahay Oil Co., No. 1 Bell, Los Angeles Co. | 30- 2-12 | 1,370 | suspended |
| Jones, W. L., No. 1 Bell, Los Angeles Co. | 31- 2-12 | 116 | suspended |
| Weist Oil Co., No. 1 Montebello, Los Angeles Co. | 34- 1-11 | 4,902 | suspended |
| Blinn & Gray, No. 1 Montebello, Los Angeles Co. | 6- 2-11 | 5,060 | to set pipe |
| Wardel & Menichini, No. 1 Montebello, Los Angeles Co. | 7- 2-11 | rig | rigged up |
| Yellowstone Oil Co., No. 1 Alhambra, Los Angeles Co. | 24- 1-13 | 3,919 | suspended |
| Yellowstone Oil Co., No. 2 Alhambra, Los Angeles Co. | 19- 1-12 | 2,015 | suspended |
| Rucker, L. W., No. 1 Calabasas, Los Angeles Co. | 26- 1-17 | 1,004 | cleaning out |
| Caballero Estates, No. 1 Calabasas, Los Angeles Co. | 23- 1-16 | 1,460 | suspended |
| Simi Oil Co., No. 1 Calabasas, Los Angeles Co. | 18- 1-17 | 4,529 | to set pipe |
| Simi Oil Co., No. 2 Calabasas, Los Angeles Co. | 18- 1-17 | 241 | sd. sh. drilling |
| Marble, Willard, No. 1 Chatsworth, Los Angeles Co. | 6- 2-16 | 1,272 | hd. sd. drilling |
| Superior Oil Co., No. 1 Newport, Orange Co. | 27- 6-10 | 4,992 | abandoning |
| Ajax Pet., No. 1 Newport, Orange Co. | 21- 6-10 | 6,360 | br. sh. drilling |
| Vaqueros Major, No. 1 Tideland, Orange Co. | 32- 5-11 | 1,022 | suspended |
| Beck, Alfred, No. 1 Corona, Riverside Co. | 8- 4- 6 | 1,110 | suspended |
| Spindletop Oil Co., No. 1 Salton Sea, Riverside Co. | 25- 7-10 | 3,493 | cleaning out |
| Duncan, N. L., No. 1 Sagebrush, Riverside Co. | 8- 4- 6 | 1,157 | suspended |
| Colan Dev. Co., No. 1 Redlands, San Bernardino Co. | 25- 1- 2 | 2,392 | fishing |
| Mason Oil Co., No. 1 Salton Sea, Imperial Co. | 1-17-15 | 626 | sd. sh. drilling |
| Woods, D. H., No. 1 Salton Sea, Imperial Co. | 7-11-16 | 660 | sd. sh. drilling |
| Borderland Oil Co., No. 1 Encinitas, San Diego Co. | 12-13- 4 | 2,519 | suspended |
| South Bay Oil Co., No. 1 Border, San Diego Co. | 31-18- 2 | 1,243 | suspended |
| Itasca Pet. Co., No. 1 Mesa, San Diego Co. | 33-18- 1 | 1,670 | hd. sh. drilling |
| Carr, O. K., No. 1 Capistrano, San Diego Co. | 13- 6- 8 | 5,250 | suspended |
| Oklahoma Oil Corp., No. 1 Palma, San Diego Co. | 25-11- 8 | 510 | cleaning out |

### IMPORTANT NORTHERN CALIFORNIA WILDCATS

| Company, well and location— | S. T. R. | Depth | Status— |
|---|---|---|---|
| Barnsdall, No. 1 Los Alamos, Santa Barbara Co. | 31- 8-33 | .... | building road |
| Western Gulf, No. 1 Santa Maria, Santa Barbara Co. | 5- 9-33 | 8,475 | br. sh. drilling |
| Midwest Oil Co., No. 1 Los Alamos, Santa Barbara Co. | 2- 7-35 | 3,450 | cleaning out |
| General Pet., No. 3 Goleta, Santa Barbara Co. | 21- 4-28 | 6,912 | redrilling |
| General Pet., No. 4 Goleta, Santa Barbara Co. | 3- 4-29 | .... | grading |
| General Pet., No. 133 Goleta, Santa Barbara Co. | 21- 4-28 | 2,030 | suspended |
| General Pet., No. 134 Goleta, Santa Barbara Co. | 21- 4-28 | 2,053 | suspended |
| General Pet., No. 136 Goleta, Santa Barbara Co. | 21- 4-28 | 2,047 | suspended |
| General Pet., No. 137 Goleta, Santa Barbara Co. | 21- 4-28 | 2,050 | suspended |
| Bowles Oil Co., No. 140 Goleta, Santa Barbara Co. | 21- 4-28 | 2,065 | suspended |
| U. S. Pet., No. 141 Goleta, Santa Barbara Co. | 20- 4-28 | 2,004 | suspended |
| U. S. Pet., No. 142 Goleta, Santa Barbara Co. | 20- 4-28 | 2,012 | suspended |
| U. S. Pet., No. 143 Goleta, Santa Barbara Co. | 20- 4-28 | 2,010 | suspended |
| El Camino, No. 149 Goleta Tideland, Santa Barbara Co. | 22- 4-28 | 2,010 | suspended |
| Bellview Oil Co., No. 159 Goleta, Santa Santa Barbara Co. | 24- 4-29 | 2,099 | suspended |
| Johnson & Strickland, No. 1-A Goleta, Santa Barbara Co. | 19- 4-27 | 4,886 | suspended |
| The Texas Co., No. 1 Carpenteria, Santa Barbara Co. | 34- 4-25 | 111 | sd. drilling |
| Sovereign Oil Co., No. 1 Guadalupe, Santa Barbara Co. | 20-10-35 | 5,500 | suspended |
| Pacific Western, No. 1 Gibraltar, Santa Barbara Co. | 14- 5-27 | 2,345 | suspended |
| Pacific Finance Co., No. 1 Carpenteria, Santa Barbara Co. Tideland | | 2,011 | suspended |
| Associated, No. 1 Rincon Creek, Ventura Co. | 19- 4-24 | 2,080 | suspended |
| Bell, H. H., No. 1 South Mountain, Ventura Co. | 22- 3-21 | 1,760 | rd. sh. drilling |
| Pure Oil Co., No. 1 S. F. Canyon, Ventura Co. | 15- 4-21 | 2,591 | suspended |
| San Pedro Co., No. 2 Sespe, Ventura Co. | 13- 4-21 | 3,850 | 500 B/D |
| Magu Synd., No. 1 Oxnard, Ventura Co. | 17- 1-21 | 5,225 | may abandon |
| Graham & Loftus, No. 1 Goose Lake, Kern Co. | 20-27-22 | 5,450 | sd. sh. drilling |
| General Pet., No. 1 Buttonwillow, Kern Co. | 6-28-23 | 2,615 | rigging rot. |
| Wilshire Oil Co., No. 1-A Buttonwillow, Kern Co. | 7-29-24 | 7,000 | suspended |
| Milham Expl. Co., No. 6 Buttonwillow, Kern Co. | 8-28-23 | 4,396 | plugging |
| Furman, T. H., No. 1 McKittrick, Kern Co. | 22-29-21 | 1,776 | sd. sh. drilling |
| Federal Drlg. Co., No. 1 Buena Vista, Kern Co. | 20-31-24 | 5,380 | suspended |
| General Pet., No. 1 Belridge, Kern Co. | 30-28-21 | 7,630 | br. sh. drilling |
| Wallace, K. C., No. 1 Belridge, Kern Co. | 32-29-21 | 4,222 | suspended |
| Rio Cal Pet., No. 1 Shale, Kern Co. | 2-27-18 | 2,355 | suspended |
| Wicker, Sy., No. 1 Arvin, Kern Co. | 12-30-28 | 3,850 | suspended |
| Shell, No. 1 Weed Patch, Kern Co. | 29-30-29 | 5,910 | suspended |
| Osborn, Colter, No. 1 Weed Patch, Kern Co. | 15-30-29 | 3,465 | suspended |
| Osborn, Colter, No. 2 Weed Patch, Kern Co. | 15-30-29 | 2,005 | suspended |
| Fullerton Oil Co., No. 1 Semitropic, Kern Co. | 25-27-23 | 2,601 | skid. rig |
| Standard, No. 1 Devil's Den, Kern Co. | 14-25-18 | 1,600 | suspended |
| Cumberland Oil Co., No. 2 Devil's Den, Kern Co. | 17-26-18 | 2,875 | suspended |
| Signal Oil Co., No. 1 Blackwell Corner, Kern Co. | 15-26-19 | 106 | suspended |
| United Kern Pet., No. 1 Mojave, Kern Co. | 26-10-14 | 1,065 | suspended |
| Meridian Oil Co., No. 1 Mojave, Kern Co. | 11- 9-15 | 4,000 | Diorite |
| Kendall Dev. Co., No. 1 Mojave, Kern Co. | 27-11- 9 | 902 | hd. sd. drilling |
| Harding, J. B., No. 1 Mojave, Kern Co. | 5-10-10 | 1,030 | redrilling |
| Barnsdall Oil Co., No. 1 Tejon, Kern Co. | 15-11-20 | 1,080 | sd. sh. drilling |
| Ritchie, J. J., No. 1 Tejon, Kern Co. | 33-11-19 | 6,025 | suspended |
| Seacanso Oil Co., No. 1 Tejon, Kern Co. | 31-11-19 | rig | suspended |
| Associated, No. 1 Jacalitos, Fresno Co. | 22-21-15 | 6,197 | suspended |
| Kingsburg Expl. Co., No. 1 Kingsburg, Fresno Co. | 30-16-23 | 2,164 | sd. sh. drilling |
| Kent & McDonald, No. 1 Carrizo, San Luis Obispo Co. | 3-32-22 | 2,476 | cleaning out |
| Trav-El Oil Co., No. 1 Carrizo, San Luis Obispo Co. | 7-32-22 | 3,450 | suspended |
| Indian Dome Oil Co., No. 1 Edna, San Luis Obispo Co. | 26-31-12 | 3,380 | cleaning out |
| Martin, J. D., No. 1 Edna, San Luis Obispo Co. | 5-31-13 | 2,990 | suspended |
| Emerich Oil Co., No. 1 Atascadero, San Luis Obispo Co. | 13-28-12 | 1,660 | br. sh. drilling |
| Schilling, C., No. 1 Atascadero, San Luis Obispo Co. | 1-29-12 | 1,650 | suspended |
| Pacific Inland, well No. 1, Monterey Co. | 19-23-15 | 2,150 | br. sh. drilling |
| Brown, W. F., No. 1 Parkfield, Monterey Co. | 15-23-14 | 1,051 | suspended |
| Guess, E. B., No. 1 Corcoran, Kings Co. | 7-21-21 | 6,197 | cleaning out |
| Byron, N. W., No. 1 Dudley Ridge, Kings Co. | 32-22-20 | rig | rigged up |
| Irma Investment Co., No. 1 Dudley Ridge, Kings Co. | 7-23-20 | 1,345 | gas well, idle |
| Irma Investment Co., No. 2 Dudley Ridge, Kings Co. | 7-23-20 | 1,001 | cemented |
| O'Donnell, J. E., No. 1 Dudley Ridge, Kings Co. | 7-23-20 | 1,635 | gas well, idle |
| Eagle Oil Co., No. 1 Dudley Ridge, Kings Co. | 15-23-20 | 691 | suspended |
| Kettleman Oil & Gas Co., No. 1-A Dudley Ridge, Kings Co. | 20-23-20 | 1,194 | gas well, idle |
| Valley Expl. Co., No. 1 Dudley Ridge, Kings Co. | 12-23-19 | 1,302 | cemented |
| Valley Expl. Co., No. 2 Dudley Ridge, Kings Co. | 12-23-19 | 1,200 | suspended |
| Knudsen & Schmidt, No. 1 Reef Ridge, Kings Co. | 36-23-17 | 4,600 | suspended |
| Seymour, L. W., No. 1 Avenal, Kings Co. | 10-23-16 | 1,148 | suspended |
| Tulare Basin Gas Co., well No. 1, Kings Co. | 17-23-19 | rig | rigged up |
| Tulaco Oil Co., No. 1 Corcoran, Tulare Co. | 26-22-22 | rig | suspended |
| Ducor Pet. Co., No. 1 Ducor, Tulare Co. | 14-24-27 | 2,200 | suspended |
| Inland Valley Oil Co., No. 1 Visalia, Tulare Co. | 24-17-24 | 2,092 | suspended |
| Ellis & Stanford, No. 1 Tulare Lake, Tulare Co. | 20-24-23 | 1,920 | testing |
| Twin State Oil Co., No. 1 Point Arena, Mendocino Co. | 14-12-17 | 7,694 | suspended |
| Orinda Pet., well No. 1, Contra Costa Co. | 32- 1- 3 | 2,120 | suspended |
| Colusa Oil Co., No. 1 Bush, Colusa Co. | 31-15- 4 | 1,026 | hd. sd. drilling |
| Oakdale Oil Co., No. 1 Oakdale, Stanislaus Co. | 3- 2-10 | 4,750 | suspended |
| Hilderbrandt, R., No. 1 Crows Landing, Stanislaus Co. | 36- 6- 7 | rig | rigged up |
| Orland Oil Synd., No. 1 Orland, Tehama Co. | 31-23- 3 | 3,040 | suspended |
| San Joaquin Expl. Co., No. 1 Los Banos, Merced Co. | 36-10- 9 | .... | location |
| Union Oil Co., No. 1 Tracy, San Joaquin Co. | 14- 3- 6 | rig | rigging up |

# Good Saturation in Bee County Tests

## Simms Pool and Saxet Tests Completed as Salt Water Wells. Operations in Mexico Being Reflected This Side of Border

By B. D. Stevenson
*Staff Correspondent, Southwest Texas Fields*

SAN ANTONIO, Tex., Dec. 28.—Southwest Texas entered the holidays with a lot of important tests hanging fire on the verge of completion. Two were completed late in the week as salt water wells. These were Al Buchanan's No. 1 Dorenfield in Bee County which had been counted on to make a 1,000-foot east extension of the Simms Pool and Neal, Milton & Kepley's No. 1 Roark in Nueces County in the Saxet Field which for the third time came in salt water. On drill stem test originally it had shown for a flowing oil well but after setting casing with every effort made to make an oil well out of it, it always came in salt water.

In the Pettus Pool in Bee County, T. B. Slick estate's No. 2 Ray at the east end of the field and an east offset to the Damac discovery well, came in a gas well with a spray of oil with ttoal depth 3,908 feet. It was killed and cored 5 feet deeper, the core showing a good saturation of oil and as the week closed it had not yet been brought back in. This test is at the east end of the new extension pool which lies southwest of the Pettus townsite pool.

At the other end of the extension pool The Texas Company's No. 1 Gremmel at 3,903 feet drilled plugs and then cored 5 feet deeper and was in process of being brought in at the close of the week. The core showed oil saturation. This test when completed as a producer will call for an east offset by T. B. Slick estate and a south offset by Buck Oil Corp. and the latter is now moving in machinery for its test.

At the east end of the extension both Houston Oil Co. with its No. 3 Portis and Slick estate with a test on the Ray will try to carry the line of production a little farther east. However, it seems improbable they can go very far in that direction, not more than one or two locations, since dry holes indicate a cross fault between the extension pool and the townsite pool.

### On the Border

Operations in Old Mexico across the river from the Laredo district in Texas is being reflected in activity on the Texas side of the river. On the Mexican side the Ohio-Mexico Oil Co. has connected its No. 1 Las Palmas to the natural gas line running from the Laredo district to Monterrey, Mexico. The well has settled to a 14,000,000-foot well, not being as large as first reported. The company is moving rig to the location for No. 2 Las Palmas a short distance east of No. 1.

Transcontinental is moving the rig from No. 1 Rio Bravo, 21 kilometers south of Reynosa which is across the river from McAllen, Tex., in Hidalgo County, to a new location about 3 kilometers east and 1½ south of No. 1 Rio Bravo and is spudding in No. 1 Charro. Transcontinental's No. 1 Camargo across the river from Roma, Tex., and 10 miles south, is changing from cable to rotary tools at about 1,000 feet, and its No. 1 Chancaca across the river from Laredo, Tex., is down about 850 feet.

The company's Rio Bravo test abandoned at 4,200 feet which made a lot of gas and oil is largely responsible for new activity in western Hidalgo County, operators playing the idea that the structural conditions extend across the river. A big California outfit is moving rig to the northwestern corner of Hidalgo County to the Slack ranch.

The Barrett-Kanellos' No. 1 J. D. Brock in the central western part of Hidalgo County is down about 730 feet. This test was first reported last summer getting under headway as the American Petroleum Engineering Co.'s No. 1 Brock. It is 7 miles northwest of Mission on the Monte Cristo Road.

LaJoya Oil & Gas Co. in the southwestern part of the county, a half mile from the Starr County line and a mile north of the Mission-Rio Grande city highway, is below 700 feet. Due east of this a few miles is Dayle L. Smith's No. 5 Fernandez down around 4,026 feet and showing some gas and oil with a lot of salt water, and the new Dayle L. Smith's No. 3 Daskam just rigging up. Mrs. Dayle L. Smith has been drilling in that territory for 13 years and No. 3 Daskam is her fourteenth test.

There are also some other operations in Hidalgo County about to get started, there being more activity in that county at this time than ever before. For the most part in that territory the surface discloses nothing as to geology.

### Balcones Fault Zone

In the Balcones fault zone Joe Bruner's No. 1 Malone at the south end of the Joe Bruner Field is a 50-bbl. well uncompleted and in the Georgetown at 2,704 feet. A core taken at 1,703-04 feet was identified as Georgetown. The test began making quite a little oil in the chalk estimated at 30 bbls. The test will stand until after the holidays and then drill to the Edwards lime. Many wells in the Bruner Field topped the Edwards at around 2,700 feet. Bruner's No. 1 Malone is being drilled on the idea of a cross fault and so far it is seeming to carry out the idea and promses well.

West of the town of Luling, Rayor's operations have been delayed. His third test on the Dunlop farm after getting sulphur water in the Edwards lime at a little below 2,500 feet started to plug back, the same as was done in the second test, in an effort to make a well in the shallower formation. The derrick caught fire and a bailer of cement dropped into the hole on top of a lot of other fresh cement and a fishing job is now in front of them.

Cole and Moseley, a half mile north on the Pierce farm, and Meyer Exploration Co., a mile still farther north, are trying to get started on tests on the theory that Rayor was a little too far to the west of the fault line that has been traced by some geologists. Their locations would be on the east side of the fault, provided it is properly placed and on the upthrow side. They have made locations but have not started.

Other than these tests and the Sun-Humble companies getting started on their No. 1 Powers in the center of Bastrop County, the Balcones is remarkably quiet. Eiser has spudded in his No. 1 Wells southeast of the lower end of the Darst Creek Field. The making of the location has been aided materially by other wildcats drilled and is considered very favorable and in a few weeks it should be down to an interesting depth. Two Grayburg tests on the Wells ranch near the Eiser location got the top of the Edwards, one at 3,896 feet and one at 3,958 feet.

### Laredo District

Important happenings in the Laredo district the past month include the completion of a 720-bbl. well by The Texas Company in its No. 4 Bishop Cattle Co., on an inside location at 2,320 feet, in the Schoolfield-O'Byrne extension in northern Duval County. On the south edge of the extension Magnolia Petroleum Co.'s No. 7 Wilson is down 2,565 feet and drilling. The depth is a little low and it may have missed the sand and mark the limits of the pool to the south. It is about 400 feet south and slightly west of the company's No. 4 Wilson which made a 500-bbl. oil well at 2,394 feet.

In the Carolina-Texas Field in Webb County, Usher Carson is down to sand depth on his No. 4-D Webster, at 3,049 feet, a foot higher than in No. 5-D Webster. His No. 5-D Webster deepened from 2,600 feet to 3,050 feet opened up some new possibilities for the field. No. 4-D is one location north and will not add much in information though it promises to add production but the next locations made by Carson may be in directions that will extend the pool.

In the Cole Field the next important test is Cole Petroleum Co.'s No. 74 Benavides, 144 feet from the northwest and 65 feet from the northeast lines of Block 8, Section 19, and approximately 200 feet north of No. 73 which came in last week standing 500 feet in oil but not flowing and estimated at 100 bbls. on the pump. To date the company has four oil wells in that section. No. 39, an old gas well that went to oil, No. 70 near it, No. 71 about 250 feet south, No. 73 about 200 feet north, and No. 72 about 400 feet east of No. 70 which got salt water. The company is feeling for an oil pool on the flank of the gas production.

In the Escobas Pool there were several producers completed but in the regular sands. United North & South Development Co. is starting a wildcat deep test in the Charco Redondo shallow pool district in the southern part of Zapata County.

## TO PLUG BACK TWIN RIVER TEST TO THIRTY FEET OF OIL SAND

By Victor Lauriston
*Staff Correspondent, Canadian Fields*

CHATHAM, Ontario, Dec. 26.—On the Twin River structure, southern Alberta, Parco Oil Co.'s No. 1, LSD 16, Section 34-1-20w4, is reported to have reached 4,072 feet. At this depth the Mead-Phillips Drilling Co. is stated to have completed its contract, the test having been carried more than 200 feet below the Ellis-Madison contact where a good oil show was encountered. The oil show was met in the top of the lime at 3,870 feet. Water was struck at 3,905 feet and a heavier flow at 3,938 feet, this being partially shut off to permit deeper drilling. The results of the deeper drilling have been merely to increase the depth, no further oil and gas shows having been encountered in more than 200 feet of the Madison. The drill has been working in about 3,200 feet of water. Complete shut off will now be made and the hole plugged back for a test of the oil sand, which is reported to have been between 30 and 40 feet thick. The sand indicated a potential production of around 150 bbls. a day of 31.5 degree crude. If the definite production does not give a satisfactory yield, the sand will probably be shot.

### Imperial Drilling

On the Lethbridge structure, Texas-Imperial's No. 1, LSD 14, Section 22-8-22w4, is drilling at 4,385 feet and making hole slowly, with the Madison lime looked for in about 90 feet. The test is on acreage secured by Imperial Oil, Ltd., from Benton Oils, Ltd., of Calgary, production being subject to 7½ per cent royalty. Imperial Oil, Ltd., secured 3,400 acres from the Benton company.

In the Mercury area, South Turner Valley, Hylo Oils' No. 1, LSD 12, Section 4-19-2w5, is reported drilling below 5,345 feet, and about 60 feet above the lime contact. The test is maintaining a swabbing production of around 100 bbls. of light crude per day from the Home sands. Imperial Oil, Ltd., is taking the production. A little gas but no additional crude was encountered in the Dalhousie sand at around 5,275 feet.

In the Central Turner Valley, McLeod Oil Co.'s No. 1, LSD 16, Section 1-20-3w5, which has been practically off production, has cleaned out and pulled back the 6-inch casing preparatory to deepening in the lime. The operations have already brought back a strong gas flow, which is making deepening difficult; and production may be taken from the present horizon.

Further south and west, Dome Oils' No. 2, LSD 16, Section 36-19-2w5, is cleaning out a bridge which formed after a shot in the lime at 5,390 feet. With about 75 feet of bridge in the hole, the well had developed considerable wet gas; the flow immediately after the shot was estimated around 20,000,000 feet a day, and the well looks like a good naphtha producer.

### Tests in the Foothills

In the Pincher Creek area, southern foothills, Weymarn Petroleums' No. 2, LSD 5, Section 7-6-1w5, is reported having trouble with caving around 4,000 feet, after reaching a depth of 4,040 feet.

On the Aldersyde Dome, Ranchmen's Gas & Oil Co.'s No. 1, LSD 16, Section 13-20-29w4, is reported making hole slowly below 5,265 feet, after some trouble with caving.

On Fisher Creek, Cotton Belt Mines' No. 1, LSD 5, Section 21-21-4w5, is working on casing at 2,625 feet.

In the Moose Mountain area, Graystone Petroleums' No. 2 Signal Hill, LSD 9, Section 34-23-5w5, is at 4,224 feet and making repairs.

### North Turner Valley

In the North Turner Valley, Model Oils, Ltd., of Calgary, has purchased the holdings of the Anaconda Oil Co., including 40 acres and an unfinished test in LSD 16, Section 22-20-3w5. The Anaconda location is about half a mile north of Model's No. 1, in LSD 8, same section; the east half of the section is Royalite Oil Co. acreage.

### Cartier-Majestic Test

Some promising developments have been reported in Cartier-Majestic's No. 1, LSD 3, Section 36-31-7w5, which is shut down for the holidays at approximately 1,100 feet. The test has been running three tours and drilling 20-inch hole and is planning to run around 1,500 feet of 18-inch casing, which is a record for large size pipe in Canada.

The location is west of Olds and northwest of Calgary, on the foothill belt

(Continued on Page 81)

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# Greasewood Well Flows By Agitation

## Osage Field Most Active in Wyoming. Whitlash Test May Be Completed as Producer Without Going Deeper. Sunday Shutdown in New Mexico

By Tolbert R. Ingram
*Staff Correspondent, Rocky Mountain Area*

DENVER, Colo., Dec. 28.—Drilling operations in the Rocky Mountain area are at a low ebb, due to few wells being started at this season of the year, and approximately two-thirds of those under way being shut down. The potential production of the Hobbs Pool in New Mexico was increased 10,595 bbls. to 1,145,417 bbls. daily as of December 16. The allowable outlet for the last half of December was put at 37,183 bbls. daily, a slight decrease. One new location was made by the Continental Oil Co. in the Hobbs Pool and two wells are being completed. The Humble Oil & Refining Co.'s plan for closing down its wells one day each week to further curtail production has been extended to the Hobbs Pool. The Ohio Oil Co., likewise, will also shut down its Hobbs wells one day each week, and other operators are expected to take the same course except for the few wells on the southwestern edge which are showing water. These will operate continuously on a reduced scale. The Ohio company also will shut in its production in the Lance Creek Field in Wyoming. Lance Creek has been shipping about 250 bbls. daily.

In Colorado the Greeley Oil Co.'s No. 1 Gadbois, two-thirds of a mile southwest of the discovery well in the Greasewood Pool, which three weeks ago was considered a failure, made two flows this week under agitation and boilers are being moved back to give it a swabbing test. The Prairie Oil & Gas Co.'s No. 1 O'Toole, 10 miles northwest of Greasewood, is drilling close to the objective.

In Wyoming, the Ohio Oil Co.'s Neiber Dome test found water in the Frontier sand in a bailing test after plugging back, but it is believed to be coming from behind the liner. The Osage Field is the most active area in the state and two new operations were reported this week. The Chadron-Osage Oil Co. is negotiating for the construction of a 1,000-bbl. refinery.

In Montana the Ohio Oil Co. tested all horizons down to the red beds at 6,219 feet at Dry Creek and is plugging back to upper sands. The Western Natural Gas Co.'s oil discovery in the Whitlash district may be completed as a producer at its present depth without going deeper.

### NEW MEXICO

#### Lea County

The potential production of the Hobbs Pool, as established by Umpire C. G. Staley, was 1,145,417 bbls. daily from 147 wells on 129 units, as of December 16. This is an increase of 10,595 bbls. in the potential and one well and two units as compared with the schedule as of December 1. The allowable outlet for the last half of December was placed at 37,183 bbls. daily, 35 bbls. less than for the first half of the month.

Another snow storm, the third of the season, and more cold weather, hampered operations in the southeastern area and little progress was made in drilling operations. One new location was made in the Hobbs Pool in the Continental Oil Co.'s No. 6-B State, C SE SW Section 33-18-38, an east offset to its No. 1-B State and a north offset to the Midwest Refining Co.'s No. 11 State. Cellar is being dug.

Continental Oil Co.'s No. 5-A State, C NW SE Section 33-18-38, was drilled to a total depth of 4,184 feet and is cleaning out to test. The 7-inch was set at 3,981 feet.

Midwest Refining Co.'s No. 8 Byers, C NW NE (cor.) Section 4-19-38, is drilling out plug after cementing 8⅝-inch at 3,950 feet with 135 sacks. Its No. 8 Byers, C NW NW Section 3-19-38, a south offset to its No. 29 Turner, is still a cellar. Midwest's No. 11 State, C NE NW Section 4-19-38, is drilling at 200 feet in the red beds.

#### Eddy County

R. D. Compton's No. 1 Compton, NE NW NE Section 8-18-27, to the southwest of the Artesia Pool and three-fourths of a mile south of some producers on the Brainard tract, is drilling at 360 feet in anhydrite and red beds. It had a little water at 105-15 feet and sulphur water at 175-80 feet. Some heavy black viscous oil was found at 190 feet.

Flynn, Welch & Yates' No. 62 State, NW cor. SE Section 10-19-28, is shut down at 925 feet in anhydrite and red beds on account of the storm.

Leonard & Levers' No. 6 State, C NW Section 28-17-29, Maljamar area, is drilling at 775 feet in anhydrite. It bottomed the salt at 645 feet.

#### DeBaca County

Matador Oil Co.'s No. 1 Woods, NE SW SW Section 6-4n-20, Salada Creek, is bottomed at 3,250 feet and is waiting for cement to set after cementing cave at 3,210-50 feet.

#### Guadalupe County

New Mexico Producing & Refining Co., Ltd.'s No. 1 McMillan, SW cor. Section 24-5n-16, Mesa Leon district, is shut down in shale at 3,275 feet waiting for the 8¼-inch. The 10-inch was set at 3,000 feet after which more water was encountered at 3,010 feet.

#### San Juan County

Ray Ortega and others' No. 2 Ute, NW NW Section 24-31-16, Westwater Dome, which was reported abandoned last week, was drilled to a total depth of 2,470 feet where salt water was encountered, before plugging began. It had some good showings in higher horizons, but not commercial. K. D. Stoddard, who was in charge of the drilling, has returned to Detroit after turning the lease back to the Indians. These interests have a 29 per cent interest in the Mancos Creek structure in Montezuma County, Colorado, where 28 shallow wells have been drilled. Some of these wells are capable of making 1 to 4 bbls. each.

The Continental Oil Co. is drilling another shallow well at Rattlesnake in its No. 27, NW SE NE Section 2-29-19, which is making hole at 605 feet. Same company's No. 17, C NE Section 2-29-19, the discovery well in the Pennsylvanian, which is being deepened, is bottomed at 6,961 feet and fishing for tools. Continental's No. 24, SW NW SW Section 1-29-19, is bottomed at 6,066 feet, after changing to cable tools, and is cleaning out at 5,450 feet. At this depth it ran into a cavity which could not be filled so as to re-establish circulation for the rotary.

### COLORADO

#### Weld County

Only four wells in Weld County showed any activity during the week. The most interesting is the Prairie Oil & Gas Co.'s No. 1 O'Toole, C SE NE Section 33-7n-62, in the Crow Creek district 10 miles northwest of the Greasewood Pool. This well is drilling below 6,760 feet and is reported through the Timpas lime and the Codell, or Nio-Benton sand. These markers were not definitely picked up and coring of them was not accomplished. This operation is strictly a wildcat and some distance from any other well. Estimates as to the depth at which the Muddy will be encountered vary, but it is expected within the next 300 to 500 feet. Whether the 7-inch, of which 7,300 feet has been ordered, will be set on top of the Muddy or carried down to the top of the Dakota probably will depend upon what the cores show.

In the Greasewood Pool interest now centers around Greeley Oil Co.'s No. 1 Gadbois, C NW NW Section 25-6n-61, three-fourths of a mile southwest of the discovery and the only well in that direction to reach the first objective. Operations were suspended on this well several weeks ago at a total depth of 6,698 feet when only 500 feet of oil stood in the hole after efforts had been made to make it a producer. Since then oil has continued to rise steadily and last Friday it had risen 5,300 feet. The bailer was run several times last Friday and the well made two flows under agitation. It was then decided to move the boilers back before swabbing or making further attempts to produce it.

Greeley's No. 1 Gadbois was drilled in with rotary tools as were also Prairie Oil & Gas Co.'s No. 1 Mortier, 6 miles to the southeast, and Colorado Associated Oil Co.'s No. 1 Pumphrey, north of Fort Morgan.

Continental Oil Co.'s No. 1 Gadbois, C SE SW Section 24-6n-61, between the Greeley's No. 1 Gadbois and the discovery well, is drilling by the lost tools after cementing whipstock at 6,540 feet and is now below the bottom of the 15-foot whipstock. It has less than 100 feet to go. It is drilling in with cable tools. This well is about one-third of a mile northeast of the Greeley well and is expected to be a producer.

Reiter-Foster Oil Co.'s No. 1 Wilson, C NE SE Section 24-6n-61, half a mile to the southeast of the discovery, is making hole slowly with machine at 400 feet after cementing the 15½-inch at 330 feet.

#### Morgan County

Prairie Oil & Gas Co.'s No. 1 Mortier, C NE NW Section 2-5n-60, 6 miles southeast of the Greasewood Pool, after plugging back from a total depth of 6,588 feet, 58 feet in the Dakota, has set whipstock and is milling through the 7-inch to test the Muddy sand at 6,465-90 feet which showed saturation in the cores, but which did not stop to test on the way down to the Dakota.

Colorado Associated Oil Co.'s No. 1 Pumphrey, C SE SE Section 14-4n-58, North Fort Morgan, is standing at a total depth of 6,176 feet, below the Lakota sand, waiting a decision as to whether it will be carried on down to test the Morrison and Sundance before plugging back. If it does not go deeper, it will be plugged back and the upper part of the Dakota and the Muddy, both of which showed some saturation, will be tested.

None of the other operations in Morgan County shows any change.

#### Rio Blanco County

California Co.'s No. 1 California-Raven, NW SE Section 30-2n-102, Rangely Dome, is drilling below 3,330 feet, and Magnolia Petroleum Co.'s No. 1 Maddock, C NW SE Section 9-2s-96, Piceance Creek, is bottomed at 2,174

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## MOUNT PLEASANT, MICHIGAN, FIELD GETS 16,000,000-FOOT GAS WELL

By Special Correspondent

MOUNT PLEASANT, Mich., Dec. 26. A new gas well gauged at 16,000,000 feet a day, the largest in the Mount Pleasant area, was brought in last night on the Bicknell lease in Section 6, Grant Township, Clare County. The well was drilled by James A. McKay of Detroit, and is the eighth project in the McKay-Mercier development south of the village of Clare. Gas pay sands were struck in the Marshall formation encountered from 1,300 to 1,500 feet deep in the Central Michigan Field.

The best oil completion since the last report from the field is John C. Arthur and others' No. 1 Schug farm, Section 22, Vernon Township, Isabella County, in what is known as the Leaton Pool. This well is rated at 700 bbls. initial production. In the same pool the Mellon-Pollock Oil Co.'s No. 2 well, 230 feet from the south line and 1,650 feet from the west line of the John Brief and others farm in the NW NE SW Section 22, Vernon Township, produced 80 bbls. initial, and the same company's No. 2 well, 380 feet from the north line and 1,820 feet from the east line of the Joseph M. Crowley farm, N half NE Section 27, same township, had a showing of both oil and gas, but drilled into water and was given up as a dry hole. It went to a total depth of 3,734 feet.

The Pure Oil Co. is due to complete No. 4 on the Stanley E. Willie farm, Section 4, Bloomfield Township, Isabella County, which is drilling for gas. Gas Producers, Inc., is drilling No. 1 on the Edmore State Bank land, west of Skerritt, in Section 5, same township.

Late development work in Greendale Township, Midland County, does not show the big wells of the past, although there is a large area of good looking territory around the new East Pool. Strange-Weller's No. 1 Rheimenschneider farm, NW NE Section 14, is rated around 200 bbls. in 24 hours at a depth of 3,567 feet. Wellman Oil Co.'s No. 1 on the A. Rineheart farm of 20 acres, SW Section 13, Greendale Township, is rated as good for close around 50 bbls. initial. The Pure Oil Co.'s No. 1 Wampler farm, Section 9, same township, is reported around 70 bbls. The Pure Oil Co. dropped into a dry hole in No. 5 on the Fred Sias farm, NE SE SW Section 8, same township, which was unlooked for, at a depth of 3,560 feet. Same company made a location for No. 6 on the same farm, 330 feet from the north and west lines of the farm.

Three new permits were issued: Edward B. Strom, No. 1 on the northwest part of the farm, SW NE Section 19, Lee Township, Midland County; W. L. McClanahan, a permit for No. 1 well, 330 feet from the south line and 990 feet from the west line of the Corning estate, SE SW Section 2, Greendale Township, Midland County, and a location for the Pure Oil Co., No. 6 well, 330 feet from the north and west lines of the Fred Sias farm, NW NW SW Section 8, same township.

In Gratiot, Miller & Combs' test, 975 feet from the north line and 800 feet from the west line of the I. J. Askegard farm, SE NW NE Section 9, Elba Township, is reported with 500 feet of gas at a depth of 511 feet. Talbot Oil Co. is drilling No. 3 in the northeast corner of the Frank Adams farm, SW SW Section 10, Greendale Township.

# Seneca County, Ohio, Has 40-Bbl. Well

## Thirteen Completions in Central Ohio, 6 Oil Producers. Indiana Has 12,000,000-Foot Gas Well. Kentucky Gets 300-Bbl. Well

By George A. Whitney
*Staff Correspondent, Central West Fields*

FINDLAY, Ohio, Dec. 28.—Three completions were reported from the old Lima Field of northwestern Ohio. The most important was the Youngstown Oil & Gas Co.'s No. 1 Vogel farm, Section 32, Seneca Township, Seneca County, and in the Tiffin Field, which is reported as doing an initial of 40 bbls. The completion of this well has long been delayed. It was credited to the Recovery Oil & Gas Co. at the time it was drilled and capped. It opens up something new for the leaseowners in that area of the Lima Field to shoot at. J. W. Zeis drilled a shallow well for gas on his farm, Section 26, Liberty Township, also in Seneca County, and the well measured but 4,000 feet, but can be put to good use for the owner. R. E. Greene is drilling for gas on the T. C. and B. G. Shoull farm, Section 30, same township. J. H. Murphy & Sons are drilling No. 3 on the Mary Getuldig farm, Section 11, same county, and Arthur Geyer is drilling No. 3 F. E. Baldwin farm, Section 30, Clinton Township, Seneca County.

A small producer for about 5 bbls. is reported on the John G. Knepper farm, Section 19, Salem Township, not far from Oak Harbor in Ottawa County, which is owned by Fremont parties.

In the McCutchinville Field, in Tymochtee Township, Wyandot County, McPheron, Miller and Cook's No. 3 on the Bowman-Brillhart farm, Section 21, is reported an excellent gas well.

### Old Wells Abandoned

A large number of old-time producing wells in the Lima Field were reported abandoned during the past few weeks. In the old East Toledo Field in Oregon Township, Lucas County, the Ohio Oil Co. abandoned Nos. 2, 4, 5, 7, 9, 10, 11, 12, 13 and 14 on the Andrew L. Metzger farm, Section 12; Nos. 3 and 4 Ira A. Kent farm, same section; Nos. 1 and 2 J. H. Heckman farm, same section; Nos. 1 and 2 Mary Woyame farm, same section; No. 1 Celestin Gladieux, Section 12; No. 1 Koch & Smith farm, Section 27; Nos. 2 and 3 Helmke & Kruse farm, Section 12, and Nos. 1, 2, 3, 4 and 6 Henry Helmke farm, also in Section 12.

In Sandusky County, Sandusky Township, the Ohio Oil Co. pulled out Nos. 9 and 11 B. F. Lattig farm, Section 7; No. 3 Emma M. Hensel, same section; Nos. 9 and 17 S. B. Waggoner farm, Section 18; No. 1 Mrs. D. Hensel farm, same section, also No. 1 Josiah Wolfe farm, Section 30. In Scott Township, same county, the same company abandoned Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 C. Bowman farm, Section 21; Nos. 1, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31 and 32 on one of the A. B. Manchester farms, Section 21, same township, and Nos. 2, 5, 6, 7, 9 and 10 on another A. B. Manchester farm, also in Section 21. In Rice Township, same county, the same company abandoned Nos. 9 and 10 on the A. Kreslick farm, Section 6, and in Washington Township, same county, pulled out Nos. 1, 2, 3, 4 and 5 William W. Engler farm, Section 24; Nos. 1 and 2 N. Engler farm, Section 1. D. J. Klingman abandoned his No. 1 on the M. L. Overmyer farm, Section 17, Washington Township. Onsel Brothers abandoned Nos. 1, 2 and 3 on the Bertha I. Phillips farm, Section 36, Montgomery Township, Wood County.

### CENTRAL OHIO

In the Central Ohio Field there were 13 completions reported, 6 being producers with an initial of 148 bbls., 2 dry holes and 5 gas wells. There were 3 locations staked and 5 new wells spudding, a total of 8.

In Lorain County the Ohio Fuel Gas Co. found a gas well in No. 1-5,578 on the P. W. Bruce farm, Section 15, Carlisle Township. Daugherty and Dempsey are drilling on the Phillip L. Smith farm, Section 15, Avon Township.

In Medina County, Edson Sons Co.'s No. 33 Marcus A. Frank farm, Section 20, Chatham Township, proved an exceptionally fine producer for the old shallow sand area, having produced an initial of 60 bbls. from 410 to 496 feet. The Preston Oil Co.'s No. 8-1,494 on the Charles Gunsal, Section 19, same township, produced initially 15 bbls. from 376 to 447 feet. Ohio Fuel Gas Co.'s No. 1-5,353 Norris & Snyder farm, Lot 14, Harrisville Township, is reported around 25 bbls. from 378 to 403 feet.

In Richland County, Daly and others are drilling on the A. J. Petit farm, Section 7, Plymouth Township.

In Muskingum County, Hopewell Township, the Whitehill Oil Co.'s No. 5 Joseph Boyer farm, Section 6, Hopewell Township, is estimated at 40 bbls.

In Athens County, I. C. Robinson is drilling on the Alvin D. Cline and W. M. White farm, Fraction 13, Lee Township.

In Stark County, Jackson Township, the Ohio Fuel Gas Co. has a gas well in No. 2-5,583 on the Martha Bricker farm, Section 7. Brendall and others' No. 1 D. M. Harold farm, Section 10, is a nice gas well, while No. 1 on the Samuel Willaman farm, same section, is reported a dry hole. Same parties have a rig up for No. 2 J. C. Steiner farm, Section 16, same township. East Ohio Gas Co. is drilling No. 1 Mary A. Gunther farm, Section 3, Lawrence Township, same county. Lyons and others have a rig in for No. 1 William and Mary Barr farm, Section 27, Plain Township.

In Fairfield County, Perry Sturm and others have a light gas well in No. 1 Mary E. Kerr farm, Section 32, Richland Township, at a depth of 779 feet.

In Guernsey County, W. Keith and others have a light oil well, estimated

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# Two Good Gordon Sand Gas Wells

## Washington County, Pennsylvania, Has One 4,000,000 Feet, Another 3,000,000 Feet. West Virginia Completes Eight Gas Producers

By Staff Correspondent

PITTSBURGH, Pa., Dec. 28.—In Southwest Pennsylvania, and in the southwestern part of Washington County, two very fair gas wells were completed, both being drilled in the Gordon sand, which heretofore has been almost unproductive of gas. In East Finley Township, the Carnegie Natural Gas Co. completed a test on the H. B. Brownlee farm which came in so strong that the tools were blown out of the hole. It is estimated to be good for about 4,000,000 feet a day. On the adjoining farm, the Asbury Stout, and in the same township, the Natural Gas Co. of West Virginia completed a second test which is rated good for about 3,000,000 feet a day. This company has a third well on this farm which is due in very soon.

No further news relative to the tests drilling east of production in Fayette County and in Somerset County. The Fayette County test in Bullskin Township, having gone through the Speechley sand, is now well on its way down to the Warren formation. It is reported that if this test is a failure, a second location will be made. The Somerset County test in Quemahoning Township is still drilling.

During the past week completions were mostly gas wells and located in West Virginia. Effort is still being expended in this state in reclaiming old wells which have declined in production.

### SOUTHEAST OHIO

A lull in operations in Southeast Ohio caused the week to be barren of completions. The deep test of the Benedum Trees interests on the Wayne Coal Co. tract in Section 26, Island Creek Township, Jefferson County, is abandoned at 5,300 feet on account of an unsuccessful fishing job which was caused by collapsed casing. It is reported the same operators may make another location for an additional deep test scheduled for 6,000 feet or better. In the same township, and Section 20, Sanders Brothers are drilling on the Virginia Crawford farm and have reached 1,000 feet. In Section 17, Richard Graham and others are down 1,000 feet in a second test on the J. A. Blackburn farm. In Jackson Township, Noble County, Warren Brothers and others have rigged up on the Mitchell farm in Section 31.

### WEST VIRGINIA

No additional production was added in West Virginia, the completions being confined to the gas areas. In Wirt County, on Crane Nest Run of Reedy Creek in Reedy district, the Virginian Gasoline & Oil Co. cleaned out and shot its old test on the Phoebe E. Woodyard farm. Production was increased from 3 to 25 bbls. a day.

### Gas Wells

Eight gas wells and one dry hole were reported completed. Probably the largest gas well completed was in Cabell County, where C. C. Wolfe completed a third well on the Ben Lomond Land Co. lease in Guayandotte district. It was drilled in the Berea sand and is showing for about 750,000 feet a day.

There were three reports from Calhoun County, which maintains fair activity, but one of these was a dry hole. In Lee district, the Mudlick Oil & Gas Co. drilled its test on the Alameda Meadows farm through the Injun sand and to a depth of 2,119 feet. It proved dry. In Sherman district, W. S. Dailey and others completed a test on the C. T. Stump farm, which proved a very fair gas well in the Salt sand at a depth of 1,638 feet. It was not shot. In Sheridan district, L. B. Carroll drilled No. 12 on the L. B. Carroll farm. It went to the Berea sand at 2,187 feet and will make a fair gas well.

In Doddridge County, the Travis Oil & Gas Co. completed a second well on the Alexander Stutler farm in Grant district which was drilled in the Big Injun sand at a depth of 2,015 feet. It proved to be a small gasser. In Gilmer County, the Pittsburgh and West Virginia Gas Co. completed two wells both in Troy district. Its No. 4,797 was drilled in on the J. E. Gains farm and is a small gas well in the Big Injun sand at 2,122 feet. Its No. 7,570 was completed on the G. O. Spurgeon farm and is also a Big Injun sand gas well at a depth of 1,951 feet. It proved somewhat larger than the Gains well.

In Lincoln County the Woodyal Gas Co. completed a test on the Charlie Honaker farm in Union district. It is showing for a light gas well from the sands at a depth of 2,348 feet. In Wayne County, the Wayne United Gas Co. completed its No. 50 on the Hoard Baldwin farm in the Brown shale at a depth of 3,084 feet. It resulted in a light gas well.

### Drilling in West Virginia

In Cabell County, R. H. Adkins and others are drilling on the B. S. Perry farm in McComas district which has reached a depth of 2,150 feet. In the same district, D. R. Campbell and others have a test on the C. C. Dunn farm drilling at 1,320 feet. In Guyandotte district, C. C. Wolfe is rigging up to start a test on the J. S. Stanley farm. Here, Wilson and Mowery have a rig standing for a second test on the Hans-Watts Realty Co. lease. In McComas district, the B. C. K. Gas Co. has abandoned a location on the W. H. Nelson farm.

In Logan County, the West Virginia Natural Gas Co. is drilling its No. 36 on the Dingess Run Coal Co. tract and has it down 2,355 feet. In Logan district, again, the same company has made another location to drill on this lease. In Chapmansville district, Estep Bland and others have reached 1,650 feet on the George C. Baker farm.

In Marion County, the Owens-Illinois Glass Co. is drilling its test on the Samuel Nixon farm in Grant district and is at present mandreling casing at 1,426 feet. In the same district, this company has a rig standing on the Joseph Orth farm. In Mannington district, Snider and Pense are drilling No. 3 on the Joseph T. Satterfield farm and have reached 825 feet.

In Wayne County, the Wayne United Gas Co. is continuing its drilling program. In Lincoln district, this company has its No. 40 on the A. W. Wilson heirs tract standing at 1,720 feet. In Stonewall district, No. 50 on the Newcomb tract is drilling at 1,900 feet. In the same district, this company has made two more locations on the Hoard Baldwin lease, on which it completed a light gas well. In Lincoln district, the Owens-Illinois Glass Co. has a location on the T. A. Copley farm. In Butler district, the Chartiers Oil Co. is down 3,250 feet on the Freeland Thompson farm but has a fishing job on hand. In Union district, A. F. Black, trustee, is drilling on the Guyan Valley lease which has reached a depth of 600 feet.

In Hancock County, the R. J. Braden Co. is drilling on the Robert Johnson

(Continued on Page 81)

# The World Oil Situation

*By W. T. Anderson*

Foreign competition was brought home to American oil men this year by the arrival of Russian and Rumanian gasoline in our domestic markets.

These comparatively small shipments aroused a much greater interest here than the more important decline in our exports which was largely due to the same cause, the rapid growth of refining and of uneconomic production abroad.

Russia's need for foreign credit to buy equipment abroad led to its exportation of petroleum products regardless of normal costs and Rumania's exports were forced by overproduction following the breaking down of the effort to curtail crude output in that country.

These abnormal factors, even more than the expansion in foreign refining, were responsible for the invasion of our home market, and were intensified by world conditions reducing general consumption.

It is a mistake, therefore, to assume that the present decline in our exports can be taken as a basis for normal calculations. We have, it is true, lost certain markets abroad but not permanently.

Foreign competition based on sales below cost cannot continue. If the Russian experiment fails it will affect its exports. If it succeeds the increased consumption in Russia will lessen the exportable surplus and remove the need for sales abroad at a sacrifice.

The Rumanians already see the folly of their persistent overproduction judging by their telegram to the American Petroleum Institute seeking an agreement on world restriction.

The other factor, world wide depression, must sooner or later pass and increasing consumption will widen the world markets for oil in which Americans can confidently expect to share as they share in exports of other commodities.

Many other great American industries have for years had to face even greater competition from foreign industries and yet have maintained their exports, and the American oil industry is in even better shape to do so because of its acknowledged leadership in petroleum technology.

This expansion of foreign production and particularly of refining has been accomplished mainly through the skill of American technicians. American engineering and American manufacturers have led in the advancement of equipment and methods and must continue to do so.

That being the case it is reasonable to assume that the American petroleum industry will continue to keep ahead of developments and through that advantage maintain its own in any foreign competition.

Today the United States produces and consumes over 60 per cent of the current world production.

America's 500 refineries have 70 per cent of the crude capacity of the world, 4,164,080 barrels daily. The rest of world has 351 refineries with a crude capacity of 1,771,770 barrels or 30 per cent.

American refineries can thus supply our domestic consumption and 10 per cent of the consumption abroad, although imports shift these figures somewhat in actual operations. About 12 per cent of our total demand for all oils was represented by exports in the first ten months of this year.

Due to the abnormal conditions noted, our exports of all oils have declined in the first ten months of this year about 22 per cent with our gasoline exports down about 31 per cent.

The Economic Committee's estimate for the nine months, September, 1931 to July 1, 1932 indicates a decline in exports of gasoline of about 15.4 per cent.

In the first nine months of this year our gasoline shipments to Europe declined 27.8 per cent; to Canada, 30.6 per cent; to Latin America, 54 per cent and to the Near and Far East, 21.4 per cent.

Where we exported 2,500,000 bbls. less gasoline to England that country imported 1,354,000 bbls. more from Rumania and 559,000 more from the Dutch West Indies. England's imports from Persia, however, were 1,395,000 bbls. less. Its total imports were 1,893,000 bbls. less.

France took 1,460,000 bbls. less gasoline from us, but took 1,346,000 bbls. more from Rumania, 996,000 bbls. more from Russia and 921,000 bbls. more from Persia, and 417,000 bbls. less from the Dutch West Indies. Its total imports were 1,423,000 bbls. more.

Germany imported 1,100,000 bbls. less from this country and 325,000 bbls. less from Rumania but took 449,000 bbls. more from Russia. Germany's total imports were 1,376,000 bbls. less.

Gasoline shipments to the United States from the Dutch West Indies were 1,620,000 bbls. less but 871,000 bbls. more to Europe, 608,000 bbls. more to South America and over 110,000 bbls. each to Canada and Australia. Total shipments from the Dutch West Indies, however, were only 85,000 bbls. larger than for a like period in the previous year.

These comparisons taken from E. B. Swanson's article in the December 17 issue of The Oil and Gas Journal show what has been happening in the foreign markets in shifting consumption. The influence of distress prices from Russia and Rumania is very clearly indicated, while the shrinkage in consumption in England and Germany and the increase in France during the period in question reflects business conditions in those countries. Since then conditions in France have not been so good.

One possible element that may enter into the world situation in the coming year is the increasing resort to tariffs. This development may revive consideration of a world conference on the supply and demand factors with a view to individual action for the avoidance of overproduction and the consequent demoralization of the world market by distress material.

The American Petroleum Institute replied to the Rumanian request that while our laws forbade definite agreement to restrict production it would, if desired, call such a conference to give each country the opportunity, in conformity with their own laws, to regulate their operations in the most intelligent manner.

Out of such a conference there might come an understanding that would stabilize the world petroleum industry to the general advantage.

While the oil industry has been deterred from direct world agreement on restricting production the sugar and copper industries appear to have been able to frame such an agreement without interference. In the case of copper the announcement was even followed by an effort to put prices on a solvent basis. It has been a subject of curious comment that sugar, (as widely consumed as gasoline) and copper should be able to reach world agreement to stabilize their markets while the oil industry should have encountered so much suspicion and obstruction.

Just at this time with all prices so much below normal and improved prices the first essential in a return to better conditions everywhere it ought to be possible for the world oil industry to get together and even be encouraged in an attempt to put that industry back on its feet.

# Sees Lessening of Coal-Oil Competition

## Sir John Cadman Expects Marketing of Two Fuels on Basis of Utilizable Thermal Units. Stresses Oil's Technical Advantages

By Sir John Cadman, G.C.M.G.
Chairman Anglo-Persian Oil Co., Ltd.

In respect to petroleum, consideration of the "British Fuel Problem" must take account of circumstances which, in many of their characteristics, are virtually the opposite of those surrounding the production and utilization of coal. The latter is produced in great quantities and of many types within our own boundaries, and our reserves appear adequate to satisfy all probable requirements for hundreds of years to come. Coal is relatively cheap. Its use is not burdened by the economic disadvantage of long hauls on land or sea; and, for many years, our coal industry enjoyed the benefits both of a home market in which it was supreme and of a large and constantly increasing export business. With respect to petroleum, however, Great Britain—far from producing and exporting—is almost exclusively an importer. It is true that in the carbonizing industries and in Scottish shale we possess indigenous sources of oil, but the output of those industries meets only a small fraction of our needs.

In considering petroleum, therefore, we must regard the British fuel problem at a wider angle and from a more distant viewpoint than is practicable in the case of coal. Great Britain is one among many important consumers of petroleum and its products, and the fact that it possesses, in coal, an alternative fuel not enjoyed by certain other consumers of petroleum, modifies, but does not fundamentally change, its situation in respect to oil.

The great industrial civilization of today may be said to have been erected on a basis of coal and iron. They might almost be called economic twins. In consequence, we find that countries in which they both exist are also those where coal consumption is greatest, where industry reveals its highest activities, and where population is most dense. With the important exception of the present century, oil, on the other hand, has played no part in the establishment of our present civilization. It is an isolated product of nature found more often than not in areas which are otherwise sterile both on the surface and at depth, and which lack, in consequence, the conditions that make for large and increasing populations. It is such countries that produce, in the main, the large exportable surpluses required by the highly industrialized regions of the world whose soil conceals little or no natural petroleum.

### Survey of World

The problem of Great Britain is therefore paralleled by that of many other countries, and we shall best attain an understanding not by restricting consideration to the circumstances of Great Britain alone, but by extending our survey to the world as a whole. In so doing, we shall encounter a range of problems each of which has its particular bearing upon our own.

Before proceeding to that survey, however, I should like to sketch the outlines of the picture now presented by oil in relation to modern life.

In January, 1920, a world census of motor vehicles—from which motorcycles alone were excluded—indicated that slightly less than 9,000,000 motor cars were in use. At the beginning of the present year, a similar census of registrations placed the aggregate at over 35,000,000—an increase of 300 per cent. In the United States there is now one motor vehicle to every 4.6 persons. In the United Kingdom the ratio is 1 to 30; and in the four British Dominions of Canada, New Zealand, South Africa and Australia, there is, on the average, a motor vehicle for every 9 to 10 members of the population.

The ubiquity of the motor car in everyday life is not without great repercussions upon industry. In the short space of 20 years, the manufacture of motor vehicles has risen from a position of relative insignificance to one, if not of pre-eminence, at least of a very high degree of importance. During the year 1929 the number of motor vehicles manufactured throughout the world attained the remarkable total of 6,200,000. Of these 5,600,000 originated in the United States and Canada; and their production necessitated the consumption, by automotive industries, of no less than 58,000,000 tons of steel, 490,000,000 pounds of rubber, 200,000,000 pounds of cotton fabric and great quantities of glass, timber and metals other than steel. The direct manufacture of motor vehicles does not, of course, represent the sum total of the industrial activity which has ensued upon the use of petroleum for land locomotion. Each of the commodities I have just mentioned—and many others—calls for a range of industrial activity preparatory to its incorporation in the finished motor vehicle; and a comprehensive study—if it were possible—of the trades and industries affected or brought into being by the motor car would probably entitle that vehicle to a premier place among the world's industrial stimuli.

### Oil Utilization

On sea, the recent developments of oil utilization—although, perhaps, less spectacular—are no less important than on land. In the year 1920 steamships (excluding war vessels) of a tonnage amounting to 9,400,000 were equipped for the consumption of oil fuel under boilers; in 1930, nearly 20,000,000 tons of vessels were so equipped—an increase of over 100 per cent. That increase is remarkable, but its importance and significance are diminished by comparison with the development that has occurred in another direction. I refer, of course, to the growing use, on sea, of the internal combustion or compression ignition engine of the type known by the name of its inventor, Diesel. The tonnage of vessels equipped with those engines has risen from 960,000 in 1920 to over 8,000,000 in 1930—an increase of no less than 745 per cent.

Oil has made it possible to navigate alike the depths of the sea and the heights of the air. I need not remind you that despite the attempts of many earlier inventors—some of whom proceeded upon lines which showed them to be the precursors of modern aviation—it was not until the advent of oil that human flight became possible. That fact alone may be deemed to entitle oil to a very great place amongst the factors which have contributed to man's dominance over his physical environment. Apart from their importance in military and naval operations, the possibilities of flight have been demonstrated most strikingly in relation to travel. Journeys which were formerly long or difficult—or both—are now greatly simplified and shortened. Few of us are lacking in personal experiences of this. The journey to Persia which took me three weeks before the war can now be made in four days. Moreover, within such countries as Persia—where climatic conditions and primitive methods of land travel over desert and mountain tracks made time an irksome factor—the passage by air has opened up the most fascinating possibilities. For instance, I learned quite recently from a Teheran correspondent that he had made a double journey by air in just over 60 minutes which under the old conditions took no less than six days. Such instances could be indefinitely multiplied, but it will suffice to mention that practically no part of the world, not even the South Pole, has now escaped the expert eye of the air-borne camera. We know incredibly more of the earth's surface today than was the case 20 years ago.

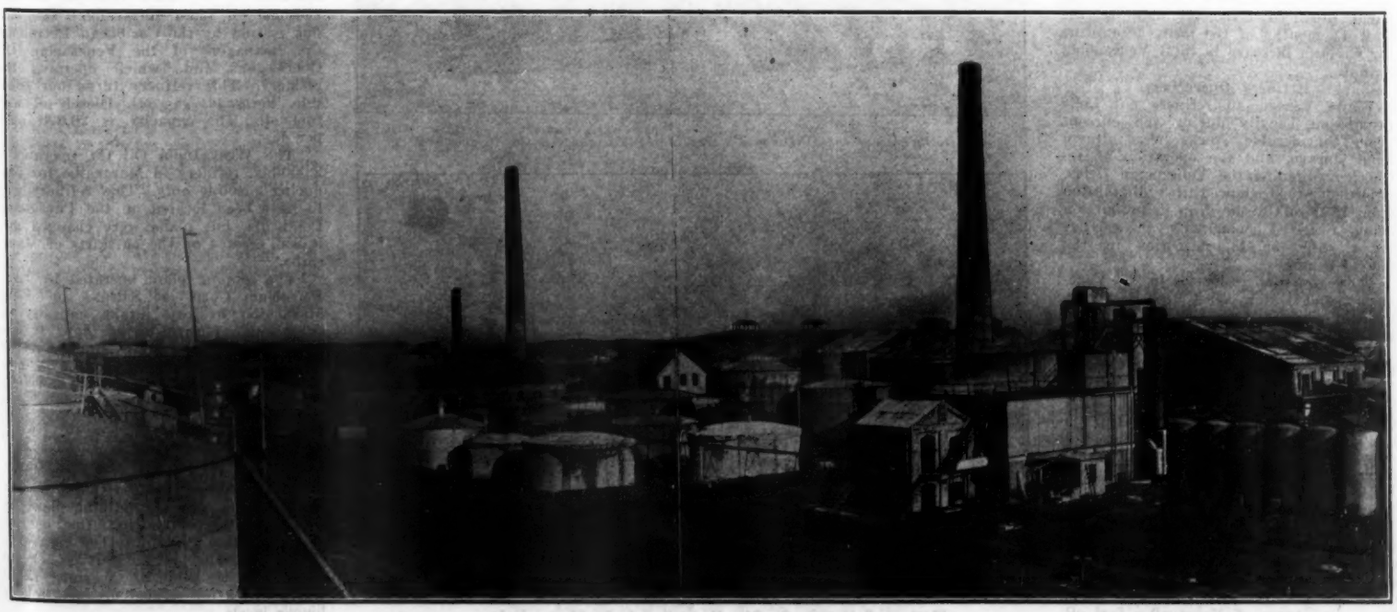
### Accelerated by Oil

It is estimated that, during the year 1920, the number of miles flown by airplanes engaged in the regular transit of passengers and freight amount to 2,250,000. In 1930, the aggregate mileage similarly performed on regular flying services attained the remarkable figure of over 69,000,000 miles—an increase of approximately 3,000 per cent.

All records for rapidity of movement, whether on land, sea or in the air, are held by mechanisms whose motive power is derived from petroleum. In the air, a speed of 379 miles per hour has been attained, on land 245 miles, and on

(Continued on Page 70)

### ALMAS FUZITO PLANT OF THE VACUUM OIL CO. R.T. IN HUNGARY



# Venezuelan Yield Cut 21,600,000 Barrels

## 1931 Crude Production Declines More Than 15 Per Cent Under 1930 Totals. Operators Slow Down Drilling Operations and Curtail Flow of Completed Wells

Venezuelan operators have held to their selfimposed curtailment program during the current year, and indicated production in Venezuela for the entire year now drawing to a close is approximately 116,100,000 bbls., as contrasted with 1930 production of 137,675,000 bbls.

A comparison of production totals of major Venezuelan operators for the first 11 months of 1931, compared with the corresponding period last year, compiled by O'Shaughnessy's Oil Bulletin, follows:

| | First 11 months | |
|---|---|---|
| | 1931 | 1930 |
| Lago | 32,795,249 | 35,342,425 |
| V.O.C. | 30,350,169 | 36,763,772 |
| Gulf | 16,433,599 | 20,839,980 |
| Carib. Pet. | 10,453,674 | 18,983,425 |
| Creole | 7,036,343 | 4,465,427 |
| B.C.O. | 1,656,280 | 1,309,336 |
| Gen. Asphalt | 80,430 | 426,800 |
| Total | 106,218,927 | 124,348,993 |
| Daily average | 318,020 | 372,302 |

Lago Petroleum & Transport Co., subsidiary of Pan American Petroleum & Transport Co. (which is in turn controlled by Standard Oil Co. of Indiana), continued the largest producer in Venezuela, with a large part of its production going to supply its large refinery at Aruba, D.W.I.

Royal Dutch-Shell companies operating in Venezuela substantially lessened their production during the year, as was the case with Gulf Oil. The sharp decline in General Asphalt's total, from 426,800 bbls. in the first 11 months of 1930 to 80,430 bbls. in the like period this year is due to the fact that Royal Dutch-Shell abrogated its royalty agreement under which it had been delivering to General Asphalt a fixed percentage of the production of its Colon properties. This royalty agreement is still in process of litigation.

### Opening of Quirequire Field

The increase in production of crude by Creole Petroleum (Standard Oil Co. New Jersey) this year is due entirely to the opening up of the Quirequire Field in a larger way by Creole. Production at Quirequire had been held back pending completion of the pipe line from the field to Carapito, on the San Juan River. Construction of the line was completed during the latter part of 1930. Crude is flowed from the field to Carapito, loaded on shallow-draft tankers, and moved down the San Juan River over the bar into deep water where it is transshipped to ocean-going tankers. The Quirequire Field produced 2,785,000 bbls. in the first 11 months of the year, accounting for Creole's increase in total Venezuelan output.

### Refinery Operations

While Venezuelan refiners cut their production heavily during the current year, considerable stocks were drawn from storage, and the operation of refineries adjoining the Venezuelan fields, it is understood, showed little diminution from 1930 totals, the drop in production being reflected principally in smaller crude shipment to refineries in the United States.

There are nine refineries in the Venezuelan and Dutch West Indies groups, three of which are very large, and aggregate daily crude capacity of the group is 323,100 bbls. Of this total, 165,000 bbls. is accounted for alone by the Royal Dutch refinery at Curacao, and 132,000 bbls. by two plants on the island of Curacao, the largest being Lago's 110,000-bbl. refinery. A plant at San Lorenzo has daily crude capacity of 17,000 bbls., and there is a 4,000-bbl. plant at La Salina and a 2,450-bbl. plant at Maracaibo.

While much of Venezuelan crude is of the heavier types, with a large fuel oil content, Venezuelan "sweet" crude shows a relatively high yield of gasoline in cracking and cracked gasolines made from some types of Venezuelan fuel oil have shown knock ratings of 76 to 78 octane number, considerably higher than the knock ratings of a large percentage of the gasoline production in the United States. Universal Oil Products Co. in a recent run of two tests on cracking La Rosa fuel oil showed the following results:

| | Run No. 1 | Run No. 2 |
|---|---|---|
| A.P.I. | 57.9 | 57.9 |
| Initial boiling point, °F. | 92 | 91 |
| End boiling point, °F. | 397 | 397 |

**A.S.T.M. 100 c.c. Distillation**

| % Distilled over | Temp., °F. | |
|---|---|---|
| 5 | 129 | 125 |
| 10 | 150 | 145 |
| 20 | 191 | 184 |
| 30 | 226 | 218 |
| 40 | 255 | 249 |
| 50 | 280 | 277 |
| 60 | 304 | 303 |
| 70 | 324 | 326 |
| 80 | 349 | 350 |
| 90 | 372 | 376 |
| Octane number | 76 | 78 |

Flashed residues obtained from above tests varied in gravity from 9.7 to 10.3 A.P.I.

### Production Curtailment

There has been a substantial lessening in field operations in Venezuela during 1931 and the major companies have practically suspended drilling for production. In addition, producing wells have been pinched in and producers are evidently determined to hold their oil underground until the world oil market improves, drawing on storage holdings to take care of running requirements during the interim.

While American companies and the Royal Dutch-Shell group are by far the major factors in Venezuelan operations, there is some production on the part of other interests. Spanish interests control considerable acreage and some production, and efforts are being made by a French group to develop production, in line with France's program of expansion in the petroleum industry.

### Crude Output

Venezuela's crude output has increased steadily since commercial production was inaugurated in 1917. The following table illustrates the pronounced rise of Venezuela as a world factor:

| Year— | Production (bbls.) |
|---|---|
| 1917 | 119,692 |
| 1918 | 317,000 |
| 1919 | 425,000 |
| 1920 | 457,000 |
| 1921 | 1,434,000 |
| 1922 | 2,201,000 |
| 1923 | 4,004,000 |
| 1924 | 9,042,000 |
| 1925 | 19,687,000 |
| 1926 | 37,226,000 |
| 1927 | 63,392,000 |
| 1928 | 105,749,000 |
| 1929 | 137,739,000 |
| 1930 | 137,675,000 |
| 1931 (est.) | 116,100,000 |

### Acreage Relinquished

In line with the general retrenchment in operating overhead, however, American companies relinquished considerable acreage in Venezuela during the current year, due to the high overhead necessary to hold this land pending development. The lands were not relinquished, however, until after the major companies had completed exhaustive geological surveys, and notwithstanding the necessity of payments to the government on undeveloped land held under concession, acreage with favorable showings is still being carried. There was some interest in Venezuela on the part of American independent operators when it became known that lands were being turned back to the Venezuelan government, but investigation showing the necessity for strong capital resources to secure and carry concessions, drilling conditions, market outlets, etc., soon showed these operators that notwithstanding proration and record low prices there was nothing to be gained by transferring their operations from the United States to Venezuela.

Considerable work has been done during the year in testing established fields, and productive horizons have been definitely located which materially extend some of these fields. In addition, the operating companies have done considerable land reclamation work during the year.

Lake tanker fleets were not increased during the year, in conformity with the "gentlemen's agreement" among the major producers, but notwithstanding the fact that production was curbed, tanker fleets were kept fairly active in moving current production and stocks from storage.

### Effect of Tariff

There were some reports during the year of plans for the construction of new refineries in Venezuela, or at near-by points, this being predicated upon the belief that the United States was about to impose an import tariff of $1 per barrel on crude oil. The plans were credited to one or more companies which have been shipping crude into the United States, and which presumably would refine in or near Venezuela for export markets in the event of a substantial tariff against oil imports going into effect in the United States. Official confirmation of these reported plans was lacking, the companies mentioned naturally preferring to keep their future plans to themselves.

H. E. Watkins, commercial attache at Caracas, in a recent report to the Department of Commerce, reported on refining operations in Venezuela proper as follows:

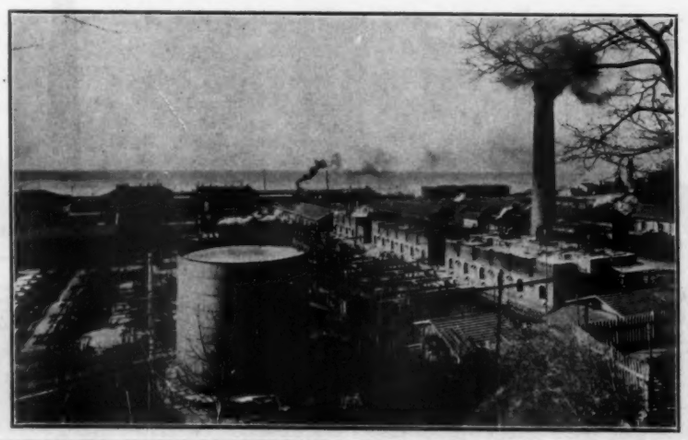
"The largest refinery in Venezuela is operated by the Shell interests at San Lorenzo on Lake Maracaibo. The output is sold by the Caribbean Petroleum Co., managers of the Venezuelan Oil Concessions, Ltd., which operates the refinery. This refinery turns out gasoline, kerosene, gas oil, Diesel oil and fuel oil. The capacity is 20,000 bbls. per day.

"The West India Oil Co. operates a 2,000-bbl. refinery in Maracaibo for producing gasoline only. This refinery was to have been located on the Paraguana Peninsula, but plans were changed and it was erected on the outskirts of Maracaibo.

"The topping plant operated by Lago Petroleum Corp. at Salinas on Lake Maracaibo has an intake capacity of 5,000 bbls. of crude oil per day. It was originally constructed to supply fuel oil to its fleet of tankers, but it is now also supplying other products for this market. The present average daily output is 435 bbls. of gasoline, 100 bbls. of kerosene, 90 bbls. of gas oil and 3,000 bbls. of fuel oil."

One or two small independent interests have been reported planning the establishment of small refining plants in Venezuela proper during the current year, but nothing definite has been done in this direction yet, and it is believed plans will be held in abeyance until world prices for refined products are at higher levels.

*Aerial photo of the Birkenhead works of the Vacuum Oil Co. in England.*



*Plant of Raffineria Di Olii Minerali S.A. in Fiume, Italy.*

# Russia Cuts into U. S. Sales to Finland

## Soviet Captures Larger Share of Petroleum Trade of Finland and Outranks American Marketers in Esthonia and Latvia

Russian competition in world oil markets, which has seriously affected American export volume during the past few years, has become particularly sharp in the Baltic states, where Russia is now running the United States a close second in Finland and has outstripped this country as a supplier of refined petroleum to Esthonia and Latvia.

Several marketing factors are common alike to Finland, Latvia and Esthonia, according to the Department of Commerce. First, the use of automobiles is limited during the long and severe winters and many ports are closed then. Second, these countries, with a total population of about 5,920,000, are essentially occupied with agriculture and forestry. Approximately 70 per cent of the population lives in rural districts, leaving only 30 per cent in the urban districts, where the larger part of the petroleum consumption takes place. Third, the standards of living are low, particularly in the southern countries; wages in the cities also are low, and only the wealthier classes can afford automobiles.

Crude oil is not imported in great quantities, as there is very little refinery activity in the area. Latvia has one refinery which has been increasing its treatment of crude oil, principally for the manufacture of lubricants. Most of the crude, however, as shown by the imports, is used for fuel. The use of gasoline has been increasing, principally for the operation of automobiles. There is a small but increasing demand for airplane gasoline. The demand for kerosene for lighting has been diminishing, reflecting the increased use of electricity, but this decline has been offset by the growing purchases of power kerosene.

Lubricating oil is in increased demand for automobiles and machinery. Shipping also requires lubricants. Except for industry, there is not a large requirement for fuel oil. It is not used commonly for heating, and ships as a rule do not bunker in this area. Naval use of fuel oil also is small. Although there is a tendency toward improvement of roads, with a consequent prospect of increased use of road oil and asphalt, present sales of these products are insignificant.

Most of the petroleum products are shipped in by water, although there is a small movement by rail from Russia to Esthonia and Latvia. Memel in Lithuania, Riga in Latvia, Tallinn in Esthonia, and Helsingfors in Finland are the principal ports of entry. With the exception of Finnish imports, transshipment via Hamburg is the usual route.

### Large Companies Lead

Several marketing factors favor large companies in this market. Extra storage facilities are necessary because many ports are closed during the long winters and stocks must be stored throughout that season. The intense competition also necessitates a large number of retail outlets in order to insure distribution. Petroleum products are imported largely by companies or agents controlled by the large foreign oil companies. The subsidiary companies import the products by tank steamer and store them at the main ports as well as at the points of consumption. They are afterward sold direct to the consumer through the importer's retail service stations or pumps, or are handled through wholesalers or retailers. In Finland co-operatives make substantial purchases. The large companies do not account for all of the imports, of course, and many smaller firms act as agents for foreign companies not directly in the field.

In Finland most of the gasoline, kerosene and crude and fuel oils enter in bulk, while the lubricants and asphalts are received in containers. In Esthonia gasoline comes in bulk and in barrels of 200 to 220 liters each; kerosene is received in bulk exclusively; lubricants in barrels of 220 kilos each and also in 1 and 5-gallon containers; and greases are shipped in barrels of 230 kilos each and also in containers of 1 and 50 pounds each. In Latvia crude oil is shipped in bulk, gasoline and kerosene in bulk and containers, and lubricants and asphalts in containers. Lithuanian import methods are similar to those in Latvia.

Liberal credit terms are customary for buyers; 90 to 120 days is the average time granted. In Latvia periods as long as six months frequently are expected. Bank guarantees are usual, although occasionally given with reluctance.

### Imports Into Finland

The United States is the largest source of Finnish petroleum imports. Russia leads in supplying crude oil, followed by Rumania and the United Kingdom. The United States is by far the leading seller of gasoline. The United Kingdom and the Netherland West Indies, next in rank, have obtained recent increases in this business. The United States maintains its lead in the decreasing kerosene market, where it is followed by the United Kingdom and Russia. Germany is the principal seller of lubricants, followed closely by the United States.

Crude imports to Finland in 1928 totaled 86,954 bbls., 18,711 from the United States. In 1929 the total was 89,159 bbls., 19,768 from this country. In 1930 the total was 116,270 bbls., and only 17,593 from the United States.

Gasoline imports in 1928 totaled 586,339 bbls., of which 334,679 were from this country. In 1929 gasoline imports were 575,746, with 320,620 from the United States. In 1930 they rose to 796,718 bbls., with 334,761 from this country.

Kerosene imports in 1928 totaled 339,557 bbls., with 185,186 from this country. In 1929 they dropped to 281,682 bbls., with 119,482 from the United States. In 1930 kerosene imports were 293,579 bbls., of which 125,889 came from the United States.

Lubricating oil imports in 1928 totaled 90,010 bbls., with 34,447 from the United States. In 1929 they were 84,119, with 29,980 from this country, and in 1930 they were 66,267 bbls., with 25,575 from the United States.

With the exception of small factories which manufacture paints and varnishes, there is no refining industry in Finland. Asphalt roads are few and short and the government favors the use of cement, a domestic product. However, there is much propaganda for new roads, and with this improvement probably will come an increased rate of automobile registration.

In 1923 only 1,891 passenger cars were registered, 174 motor buses, 830 trucks and 1,769 motorcycles. In 1930 registration had increased to 24,040 passenger cars, 1,419 buses, 10,775 trucks and 5,404 motorcycles.

Recent reports state that prevailing prices in Helsingfors were as follows, in marks (mark=$0.0252): Gasoline, 3.55 marks per kilo wholesale and 2.65 per liter retail; kerosene, 1.3 marks per kilo wholesale and 1.3 per liter retail. Prices increase elsewhere in proportion to distance and freight charges.

### Imports Into Esthonia

Imports of petroleum products into Esthonia are not large, and Russia is by far the leading source of supply, furnishing more than twice the amount that comes from the United States, next in rank. Kerosene is the most important product, and Russia has been continually obtaining a large share of the market while the United States not only has been decreasing its proportion of total sales but also declining in actual volume. Russia, furthermore, has been increasing its contributions of gasoline to Esthonia, taking a larger share of the market each year, and while the United States has increased its actual sales, its percentage has declined. Esthonian gasoline consumption has been estimated at 7,000,000 liters a year.

Russia has about one-third of the lubricant market, but American sales of lubricants are increasing more rapidly than the Russian, owing to the reputation of American lubricants for superior quality.

Crude imports into Esthonia in 1928 totaled 18,228 bbls., with 2,317 from the United States. In 1929 they were 20,131 with 6,380 from this country, and in 1930 the total was 21,280 bbls. with 6,244 from the United States.

Gasoline imports in 1928 were 42,528 bbls. with 12,461 from the United States. In 1929 they were 49,342 bbls. with 13,299 from this country, and in 1930 the total was 77,350 bbls. with 21,497 from this country.

Kerosene imports were 112,725 bbls. in 1928 with 39,541 from the United States. In 1929 they were 124,817 bbls. with 25,829 from this country. In 1930 they were 135,477 bbls. with 18,585 from the United States.

Lubricating oil imports in 1928 were 15,892 bbls. with 2,121 from the United States. In 1929 they were 17,382 bbls. with 5,201 from this country, and in 1930 they were 16,484 bbls. with 5,348 from the United States.

Fuel imports in 1928 were 8,362 bbls.; in 1929, 2,901 bbls., and in 1930, 4,806 bbls.

Receipts of paraffin wax in 1930 totaled 436,403 pounds, as compared with 443,060 in 1929, and 494,349 in 1928. Latest available data for imports of grease, 1928, record 450,044 pounds. Asphalt imports amounted to 106 metric tons in 1928, 321 in 1929, and 271 in 1930.

Gasoline produced from shale oil accounts for about 20 per cent of Esthonian consumption. Other products from shale include a small amount of crude oil, kerosene, lubricating oil and fuel oil. The government is exerting considerable effort to promote the shale industry, and has increased tariffs on imported petroleum products as well as urged industries and municipalities to use the domestic products. The inferior quality of the shale products, however, and the fairly high cost of producing them, tend to reduce their competitive importance.

Automobile registration is not large in Esthonia, but has been increasing. In 1925 registrations were 503 passenger cars, 364 trucks, 145 buses and 337 motorcycles. In 1930 these figures had been raised to 1,785 passenger cars, 1,123 trucks, 187 buses and 551 motorcycles.

### Oil Trade in Latvia

Russia is by far the leading supplier of petroleum products to Latvia and the United States ranks second. In 1930 Russia furnished 85 per cent of the crude oil imported and practically all the remainder came from America. Russia supplies about half of the gasoline and the United Kingdom and the United States almost all of the remainder. In the past few years the United States has been losing slightly in the gasoline market and very substantially in the kerosene trade. Russia and Poland each supplies more kerosene than the United States, which, however, has been gaining rapidly in sales of lubricants, in which it almost equals the Russian contributions.

Crude imports into Latvia were 89,082 bbls. in 1928 with none recorded from the United States. In 1929 they were 95,067 bbls. with 4,613 from this country, and in 1930 they totaled 157,220 bbls. with 23,303 from the United States.

Gasoline imports in 1928 were 68,697 bbls. with 20,001 from the United States. In 1929 they were 71,282 bbls. with 13,039 from this country, and in 1930 totaled 92,990 bbls. with 18,182 from the United States.

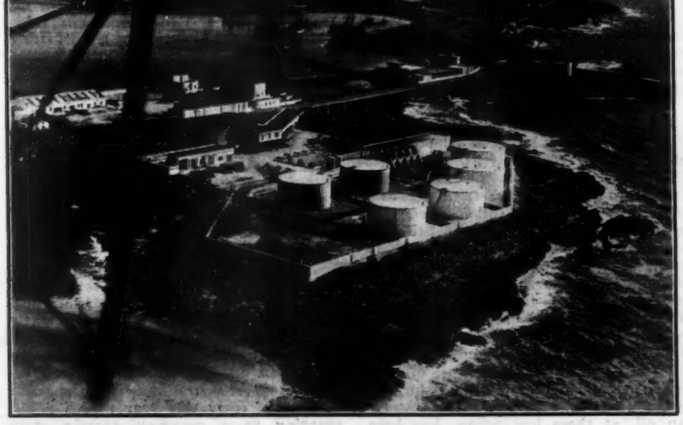
Kerosene imports in 1928 totaled 144,753 bbls. with 49,778 from the United States. In 1929 they were 130,433 bbls. with 16,618 from this country, and in 1930 they totaled 132,331 bbls. with 19,112 from the United States.

Lubricating oil imports in 1928 totaled 10,008 bbls. with 1,778 from the United States. In 1929 they were 13,076 bbls. with 3,689 from this country, and in 1930 they were 17,752 bbls. with 6,153 from the United States.

Latvia has no mineral oil production whatever, and only a small refining industry, which works over some of the imported raw products but is only a small factor in the domestic market.

Latvian exports of lubricating oils increased from 20,302 bbls. in 1928 to 33,332 in 1929, and 45,486 in 1930. The details of distribution in 1930 are not available, but in other years the bulk of the exports went to Germany, the United Kingdom and Esthonia. In 1929, 10,682

(Continued on Page 68)



*Vacuum Oil Co.'s installation at Tedhala, Morocco.*

# Rumania Unsettled World Market in '31

## Increase in Crude Production Puts Rumania in Fourth Place in Ranks of World Producers, Passing Persia. Conservation and Curtailment Planned

While Russia continued the "official" menace to the world petroleum balance during 1931, Rumania came to the fore as an unsettling factor, and competition afforded by Rumanian refined products in many European markets this year has had far reaching effects, extending all the way to the Gulf and East Coast markets.

Under the stimulus of a breakdown in the proration agreement arrived at in Rumania late in 1930 (which lasted but slightly over a month), and an apparently unrestricted race for production, Rumanian crude production this year was consistently stepped up to new high levels, and aggregate output for the full year is expected to be in the neighborhood of 47,000,000 bbls., compared with 41,680,000 bbls. for the year 1930. Rumania in the current year passed Persia as an oil producing country, and moved up from fifth place, its 1930 ranking, to fourth place this year, exceeding Persia's production by some 1,500,000 bbls., whereas in 1930 Persian output was almost 4,000,000 bbls. in excess of that of Rumania.

Rumania's sudden rise to eminence in the field of world producers has not been accomplished without dire results to the Rumanian industry, including such unfortunate practices as selling at cost and under, and the leading Rumanian interests are now prepared to call a halt. The association of Rumanian producers, meeting a few weeks ago, adopted in principle the plan for world production proposed by J. B. Aug. Kessler of the Royal Dutch combine, and in a cable to the American Petroleum Institute asked that body to take the initiative in a meeting of world producers designed to cut production until stocks of crude and products above ground have been substantially reduced. While the American Petroleum Institute, because of the anti-trust laws of this country, is unable to endorse the Kessler plan or even to adopt it as a basis for arriving at an international accord, the American body has signified its willingness to get together with producers from other major crude producing countries for a thorough discussion and exchange of views regarding the world position.

### Rumania as Market Maker

Rumania's production of refined products early in the spring showed a sharp increase and this, coupled with declining domestic consumption, threw a heavy burden on export markets. For the first time in many long years, Rumania wrested the leadership from the Gulf as the "maker" of the world market for both gasoline and kerosene, and the American trade witnessed the novel sight of American sellers meeting Rumanian quotations, rather than the other way about.

While world markets have rallied somewhat since the Rumanian oil trade began its dumping early in the year, the market is still feeling the repercussions of the Rumanian price debacle. Gulf markets are still affected to a considerable extent by Constanza quotations on export Rumanian gasoline and kerosene and a number of cargoes, for which inquiries were submitted to sellers at the Gulf, have gone to Rumania during the past few months.

Rumania's importance as a world producer has been brought forcibly to the attention of the American trade and public as well by the shipping of Rumanian gasoline into Detroit, in competition with motor fuel from the Group 3 and Whiting, Ind., refining areas. Some 15,000,000 gallons in all are involved in the Detroit transaction, of which approximately 60 per cent has already been delivered. The initial cargo of Rumanian gasoline reached Detroit by water, being transshipped via Montreal, but subsequent cargoes have come into Baltimore and moved to Detroit via tank car. The Rumanian product analyzes well, is of 65 octane number, and aside from being slightly off color, a negligible factor in these days of "rainbow gasoline," compares exceedingly well with the domestic product.

With but limited domestic consumption, Rumania has a large production of crude and is very well equipped with refineries. Crude in Rumania was selling at from 17 to 27 cents per barrel at last reports, and gasoline at Constanza was priced at 4.5 cents per gallon. Gasoline is run from the refining areas to the export terminal at Constanza via pipe line.

### Rumanian Production

There are 55 refineries in Rumania, the largest of which, with daily crude throughput capacity of 26,500 bbls., is located at Campina. Most of the other plants are in the vicinity of Ploesti, where 15 refineries, with aggregate daily crude capacity of some 98,700 bbls., are grouped. At present levels of production and consumption, Rumania has close to 100,000 bbls. per day exportable surplus, and the marketing of this oil, largely in the form of refined products, has wreaked havoc for other world producers in many European markets.

Total Rumanian crude production for the first nine months of the year amounted to 5,068,674 tons, compared with 4,298,538 tons in the same period of 1930, an increase of 770,136 tons. Principal producers, with the total produced in the first nine months of 1931, follow:

| | Tons |
|---|---|
| Astra Romana | 871,752 |
| Steaua Romana | 738,161 |
| Concordia | 643,871 |
| Phoenix Oil | 558,190 |
| Rom.-Americana | 474,903 |
| Creditul Minier | 454,445 |
| Colombia | 237,530 |
| I. R. D. P. | 214,288 |
| Bondajul | 136,498 |
| Prahova | 131,970 |
| Romano-Africana | 70,519 |
| Foraky Roman | 62,778 |
| Dacia Romano | 53,859 |
| Starnaptha Dacia | 52,619 |
| Metal-Petrol | 51,990 |
| Petrolul Roman | 48,466 |
| Romano-Belgiana | 42,967 |
| Sondrum | 36,009 |
| Petrolmina | 26,286 |
| Subsolul Romano | 25,092 |
| Mirafor | 19,850 |
| Starnaphta | 14,953 |
| Anglo-Petrol | 14,300 |
| Craiova | 13,073 |
| Naphta-Roman | 11,405 |
| Petrol-Block | 11,404 |
| Gallianaphta | 11,054 |
| Danube Trad. Co. | 10,706 |

Royal Dutch-Shell and Standard Oil Co. (New Jersey) are both active in Rumania, through subsidiaries, and the efforts of these two groups have been largely responsible for the progress which has been made thus far in bringing the Rumanian industry into line in the move for a world conservation program, although the Rumanian government has shown a friendly attitude toward the prorating and conservation plan.

### Bunker and Diesel Oils

While Rumania wrought havoc in the Gulf gasoline and kerosene export market during the current year, the effects of increased Rumanian exports was not confined to the Gulf market. East Coast refiners, as well, were seriously affected by the steadily growing competition of Rumanian Diesel and bunker oils in European ports, and competition from this source was largely instrumental in forcing several cuts in bunker and Diesel oil prices at East Coast ports in this country, carrying the market down to 60 cents per barrel for bunker "C" oil and $1.30 per barrel for Diesel oil, the lowest prices in the recorded history of the American oil industry. While American oil, at these low prices, has been successful in holding its markets against the inroads of Rumanian sellers, the situation is far from satisfactory from the standpoint of American refiners, and it is felt that any accord or understanding on world curtailment would be reflected almost immediately in higher markets for these two oils, which have been "deflated" out of all proportion to the remainder of the refined products list.

Rumanian refiners have made numerous improvements in their plants during the past few years, and the leading Rumanian refineries now compare favorably to the general run of plants in other parts of the world from the standpoint of operating efficiency and modern equipment, while labor and other operating costs in Rumania are substantially under those now prevalent in the United States.

### Rumanian Exports

While Rumanian producers are on record as favoring a world accord for the limitation of production, they are by no means disposed to relinquish the ground they have gained as marketers in large consuming countries in Europe. As indicative of the Rumanian desire for further expansion in these fields, a committee representing the government and the Rumanian industry was recently appointed to make a survey of the French petroleum situation with a view of obtaining a greater percentage of the petroleum business of France for Rumania.

Although no definite Rumanian sales to the United States are on record, besides the transaction involving the shipment of 15,000,000 gallons of gasoline from Constanza to Rumania, there have been various rumors in domestic trade circles recently indicating that further Rumanian shipments of gasoline, and quite possibly kerosene and other products, might be made to this country. Rumania is favored in selling here, not only by the low export prices quoted at Constanza but by the distressed conditions ruling in the tanker market as well. Recent shipments from Constanza to Baltimore have been made at an approximate cost of three-quarters of a cent per gallon, and this low rate enables Rumanian gasoline to reach interior markets at prices sufficiently low to afford stiff competition to the domestic product. The low rates to U. S. Atlantic ports and Montreal, of course, are made possible by the fact that foreign tankers coming to the Gulf, Atlantic Coast, or the Dutch West Indies refinery zones for cargoes of refined products for Europe are willing to bring cargoes across at rates that would be ridiculously low in normal times, rather than make the voyage in ballast.

Total production of refined products by Rumanian refineries in 1930, is summarized by "Moniteur de Petrole Roumain" at 5,444,096 metric tons, divided as follows: Gasoline, 1,181,859 metric tons; white spirit, 77,374 tons; lamp oil, 1,066,702 tons; gas oil, 655,139 tons; lubricating oil, 105,971 tons; paraffin wax, 7,578 tons; asphalt, 23,820 tons; residues, 1,959,371 tons.

Exports of petroleum from Rumania for 1930, with comparison with the previous year's totals, are given by the same authority as follows:

| | Metric tons 1930 | 1929 |
|---|---|---|
| Crude oil | 69,361 | 2,542 |
| Motor spirit | 1,119,469 | 802,421 |
| Lamp oil | 941,704 | 774,231 |
| Gas oil | 547,615 | 348,914 |
| Fuel oil | 1,103,661 | 738,641 |
| Lubricating oil | 71,344 | 62,584 |
| Paraffin wax | 2,366 | ..... |

### Improving Export Outlets

Adequate plans have been made by the Rumanian oil industry for handling increased export operations. The Rumanian parliament early this year passed a bill granting to a company (partly state owned) the right to build a new gasoline and kerosene pipe line from Baicoi to Constanza, a distance of 296 kilometers, with daily capacity for 2,000 tons.

The export terminal at Constanza has been considerably enlarged and modernized to facilitate loading of export cargoes. The number of berths in the petroleum basin has been enlarged and two new 10-inch pipe lines, one for kerosene and the other for gasoline, were completed and placed in operation this year. The harbor has been enlarged to facilitate tanker loading, and the space of time required for loading greatly shortened. Considerable new storage tankage has been erected at Constanza.

The 10-inch kerosene pipe line from the refinery area to Constanza has been improved by replacing the 5-inch sections at several points by 10-inch line, and a new pumping station has been placed in operation at Buzau, increasing the line's daily capacity from 1,250 to 2,500 tons per day. Tank car service from the oil fields and refining zones to Constanza was increased by the State Railway during the year from 10 trains daily to 16 and 18 trains per day, the average number of tank cars per train being 35, capable of carrying 500 tons of gasoline. A double track is being constructed which will result in further increasing tank car movement to Constanza.

## EXPORTS OF EQUIPMENT AND DRILLING MACHINERY

By C. E. Kern

*Washington Bureau, The Oil and Gas Journal*

WASHINGTON, D. C., Dec. 28.—Canada was the leading importer of American petroleum well and refinery machinery (other than drilling apparatus) during October, such imports being valued at $133,095. In the same month Canada imported from the United States petroleum and gas well drilling apparatus valued at $2,261.

Soviet Russia in Europe was the next largest importer of American oil machinery, the drilling apparatus being valued at $46,556 and other well and refinery machinery valued at $13,513.

Mexico imported refinery equipment and machinery, other than drilling, valued at $26,615 and drilling apparatus valued at $4,605.

Persia imported from the United States drilling apparatus valued at $28,743.

British India imported $32,500 worth of drilling apparatus and $13,724 worth of other oil well and refinery machinery.

Venezuela's imports of our drilling apparatus was valued at $10,960 and other well and refinery machinery valued at $2,894.

Japan's imports of drilling apparatus was valued at $4,858 and other well and refinery machinery valued at $8,247.

Colombia's imports of drilling apparatus was valued at $9,415, and Argentina's imports of the same class of machinery amounted to $13,736.

The United Kingdom's imports of drilling apparatus was valued at $4,471. Th imports by Germany of refinery and we machinery (other than drilling) was va ued at $2,115.

Rumania's imports aggregated in valu $7,600 of drilling and $6,504 of refiner and other well machinery.

Spain took $2,475 worth of drillin apparatus and Trinidad and Tobago $ 255 worth of the same and $5,840 wor of refinery and other well machinery.

Imports of this class by the Netherlan West Indies, were negligible.

The total exports of the United Stat of petroleum and gas well apparat were valued at $181,776 and other troleum well and refinery machinery $248,654 during the month of October.

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# Steady Growth of Refineries Abroad

## Increasing Factor in Declining Demand for American Exports of Refined Products. Total of 351 Plants Outside United States

Steady growth of foreign refinery facilities is a growing factor in the falling demand for American refined products, and indications point to further developments along these lines, with additional inroads into American export volume.

As of September 1, 1931, there were a total of 351 refineries in existence outside of the United States, with daily average crude capacity of 1,771,770 bbls. In addition to these plants, there were 14 additional refineries in the course of construction, not including Russia, where additional refinery building is under way, although definite details as to the scope of this work are lacking.

With an important refinery construction program under way in France, Europe has shown a pronounced growth as a factor in the petroleum refining industry, with a total of 247 refineries, with daily average crude capacity of 790,300 bbls. In addition to existing plants in Europe, one new refinery is under construction in Germany and 10 in France.

Second to Europe in importance in the world refining picture (outside of the United States) comes South America, with 38 existing refineries, with average daily crude capacity aggregating 433,620 bbls., and one new plant building, and others projected. Argentina is the largest factor in South America, with 16 refineries, with total daily average crude capacity of 56,770 bbls. From the standpoint of productive capacity, however, the nine refineries located in the Dutch West Indies and Venezuela, with daily average capacity of 323,100 bbls., far outrank in importance the greater number of plants located in the Argentine.

Canada, with 20 refineries with 117,700 bbls. total daily average crude capacity, and two additional refineries building, is an important factor, while Mexico, with four large refineries, with combined daily average crude capacity of 140,000 bbls., is likewise an important component of the world refining picture.

### Plants in Asia

There are now 24 refineries in Asia. Japan, with 14 plants, with aggregate average daily crude capacity of 23,350 bbls., is growing in importance, although the one refinery in Persia, with daily average crude capacity of 95,000 bbls., is by far the most important refining installation in Asia. India's seven refineries have daily average crude capacity rating aggregating 24,800 bbls., while the two small plants in Iraq are rated at 2,150 bbls. per day.

There are 10 plants in the Dutch East Indies, rated at 108,600 bbls daily average crude capacity, one at Sarawak with 15,000 bbls. daily capacity, and three small units in Australia with combined daily average crude capacity of 4,350 bbls.

### Refineries in Europe

Completion of the French refinery construction program within the next few years will materially enhance that company's position in the European market. At present, France's three refineries have combined daily average crude capacity of but 14,500 bbls., but this total will be increased many times over with completion of present construction operations. Russia ranks at the head of Europe's refining industry, with 47 plants, with combined daily throughput capacity of 400,000 bbls., far outranking Rumania with its 51 plants, with combined daily average crude capacity of 154,750 bbls., and Great Britain's 14 plants, with aggregate daily crude capacity of 111,500 bbls.

The list of refineries, outside the United States, as of September 1, 1931, and compiled by Standard Oil Co. (New Jersey), is given herewith.

### SUMMARY OF FOREIGN REFINERIES AS OF SEPTEMBER 1, 1931

(Barrels of 42 gallons)

| Country— | No. of plants | Daily ave. crude cap. | Plants bldg. |
|---|---|---|---|
| Mexico | 4 | 140,000 | |
| Canada | 20 | 117,700 | 2 |
| Cuba | 1 | 2,500 | |
| Total No. America | 25 | 260,200 | 2 |
| Venezuela and D.W.I. | 9 | 323,100 | |
| Argentina | 16 | 56,770 | 1 |
| Trinidad | 5 | 28,700 | |
| Peru | 2 | 17,050 | |
| Colombia | 1 | 7,000 | |
| Ecuador | 3 | 650 | |
| Bolivia | 2 | 350 | |
| Total So. America | 38 | 433,620 | 1 |
| Russia | 47 | 400,000 | (?) |
| Rumania | 51 | 154,750 | |
| Great Britain | 14 | 111,500 | |
| Germany | 30 | 33,200 | 1 |
| Poland | 49 | 28,200 | |
| France | 3 | 14,500 | 10 |
| Austria | 7 | 14,300 | |
| Czechoslovakia | 11 | 9,100 | |
| Hungary | 7 | 7,000 | |
| Holland | 3 | 6,850 | |
| Jugoslavia | 4 | 3,250 | |
| Belgium | 7 | 1,900 | |
| Italy | 7 | 1,900 | |
| Sweden | 1 | 1,250 | |
| Spain | 2 | 1,150 | |
| Norway | 1 | 1,000 | |
| Latvia | 1 | 300 | |
| Denmark | 2 | 150 | |
| Total Europe | 247 | 790,300 | 11 |
| Persia | 1 | 95,000 | |
| Japan | 14 | 23,350 | |
| India | 7 | 24,800 | |
| Iraq | 2 | 2,150 | |
| Total Asia | 24 | 147,300 | |
| Egypt | 2 | 7,400 | |
| Canary Islands | 1 | 5,000 | |
| Total Africa | 3 | 12,400 | |
| Dutch East Indies | 10 | 108,600 | |
| Sarawak | 1 | 15,000 | |
| Australia | 3 | 4,350 | |
| Total Oceania | 14 | 127,950 | |
| Total foreign | 351 | 1,771,770 | |

### REFINERY CENTERS OUTSIDE UNITED STATES AS OF SEPTEMBER 1, 1931

#### CANADA

| | | |
|---|---|---|
| Montreal | 2 | 39,000 |
| Sarnia | 2 | 23,200 |
| British Columbia | 3 | 18,200 |
| Toronto | 2 | 8,000 |
| Calgary | 2 | 7,500 |
| Regina | 1 | 7,200 |
| Halifax | 1 | 7,000 |
| Coutts | 2 | 6,000 |
| Lethbridge | 2 | 550 |
| Winnipeg | 1 | 500 |
| Edmonton | 1 | 350 |
| Wainwright | 1 | 150 |
| Total | 20 | 117,700 |
| **Building** | | |
| Montreal | 1 | ..... |
| Nova Scotia | 1 | ..... |

#### ECUADOR

| | | |
|---|---|---|
| Guayaquil Peninsula | 3 | 650 |

#### MEXICO

| | No. of plants | Daily ave. crude cap. |
|---|---|---|
| Tampico | 3 | 115,000 |
| Minatitlen | 1 | 25,000 |
| Total | 4 | 140,000 |

#### VENEZUELA AND D.W.I.

| | | |
|---|---|---|
| Curacao | 1 | 165,000 |
| Aruba | 2 | 132,000 |
| San Lorenzo | 1 | 17,000 |
| La Salina | 1 | 4,000 |
| Maracaibo | 1 | 2,450 |
| Caribmas | 1 | 1,800 |
| Tarra | 1 | 600 |
| Tocuyo | 1 | 250 |
| Total | 9 | 323,100 |

#### ARGENTINA

| | | |
|---|---|---|
| La Plate | 8 | 46,050 |
| Com. Rivadavia | 3 | 11,500 |
| Bahia Blanca | 2 | 3,700 |
| Pl. Huincul | 1 | 720 |
| Embaracion | 1 | 500 |
| Lomitas | 1 | 300 |
| Total | 16 | 56,770 |
| **Building** | | |
| Buenos Aires | 1 | ..... |

#### TRINIDAD

| | | |
|---|---|---|
| Pointe-a-Pierre | 1 | 21,000 |
| Point Fortin | 1 | 5,000 |
| Brighton | 1 | 1,200 |
| La Brea | 1 | 1,000 |
| Tabaquite | 1 | 500 |
| Total | 5 | 28,700 |

#### PERU

| | | |
|---|---|---|
| Talara | 1 | 16,800 |
| Zorritos | 1 | 250 |
| Total | 2 | 17,050 |

#### COLOMBIA

| | | |
|---|---|---|
| Barranca | 1 | 7,000 |

#### RUSSIA

| | | |
|---|---|---|
| Baku | 19 | 223,000 |
| Grosni | 15 | 128,000 |
| Batoum | 5 | 30,000 |
| Tuapse | 1 | 6,500 |
| Yaroslavi | 2 | 5,500 |
| Krasnodav | 1 | 3,000 |
| Varinsk | 1 | 3,000 |
| Leningrad | 1 | 600 |
| Uzbeck Republic (Russian Turkestan) | 2 | 400 |
| Total | 47 | 400,000 |
| **Building** | | |

Several cracking and topping plants are being built. Accurate details are not available.

#### RUMANIA*

| | | |
|---|---|---|
| Ploesti | 15 | 98,680 |
| Campina | 1 | 26,500 |
| Baicoi | 1 | 7,000 |
| Bucarest | 3 | 3,800 |
| Targavista | 5 | 3,700 |
| Cernavada | 1 | 3,500 |
| Buzau | 2 | 2,080 |
| R. Sarat | 1 | 2,000 |
| Moinesti | 6 | 1,240 |
| Plopeni | 1 | 1,200 |
| Others | 15 | 5,050 |
| Total | 51 | 154,750 |

*The majority of Rumanian plants are in the vicinity of Ploesti. Owing to the size of Rumania on the world map the major portion of the refining centers shown above were included in Ploesti.

#### CUBA

| | | |
|---|---|---|
| Havana | 1 | 2,500 |

#### BOLIVIA

| | | |
|---|---|---|
| Sanandita | 1 | 200 |
| Camiri | 1 | 150 |
| Total | 2 | 350 |

#### GREAT BRITAIN

| | | |
|---|---|---|
| Wales (Swansea) | 1 | 40,000 |
| London | 3 | 30,000 |
| Scotland (Edinburgh) | 4 | 27,500 |
| Southampton | 1 | 9,000 |
| Manchester | 1 | 3,000 |
| Hull | 2 | 1,000 |
| Rochester | 1 | 1,000 |
| Medway | 1 | 0 |
| Total | 14 | 111,500 |

#### GERMANY

| | | |
|---|---|---|
| Harburg | 2 | 14,450 |
| Manheim | 1 | 2,400 |
| Leunawerke | 1 | 4,500 |
| Ostermoor | 1 | 1,300 |
| Bremen | 2 | 1,270 |
| Others | 23 | 9,300 |
| Total | 30 | 33,200 |
| **Building** | | |
| Total | 1 | 1,200 |

#### POLAND

| | | |
|---|---|---|
| Central | .. | 13,502 |
| Western | .. | 12,027 |
| Eastern | .. | 2,671 |
| Total | 49 | 28,200 |

#### FRANCE

| | | |
|---|---|---|
| Rouen | 1 | 7,500 |
| Dunkirk | 1 | 5,000 |
| Strasbourg | 1 | 2,000 |
| Total | 3 | 14,500 |
| **Building** | | |
| Havre | 4 | 47,000 |
| Marseilles* | 1 | 7,000 |
| Dunkirk | 1 | 6,000 |
| Bordeaux† | 1 | 6,000 |
| St. Nazaire | 1 | 6,000 |
| Brest | 1 | 6,000 |
| Frontignan | 1 | 2,000 |
| Total | 10 | 80,000 |

*Two planned. To start construction shortly. †One planned. To start construction shortly.

#### AUSTRIA

| | | |
|---|---|---|
| Vienna | 1 | 12,600 |
| Others | 6 | 1,700 |
| Total | 7 | 14,300 |

#### CZECHOSLOVAKIA

| | | |
|---|---|---|
| Total | 11 | 9,100 |

#### HUNGARY

| | | |
|---|---|---|
| Budapest | 4 | 4,950 |
| Others | 3 | 2,050 |
| Total | 7 | 7,000 |

#### HOLLAND

| | | |
|---|---|---|
| Rotterdam | 2 | 5,700 |
| Flushing | 1 | 1,150 |
| Total | 3 | 6,850 |

#### JUGOSLAVIA

| | | |
|---|---|---|
| Bosanki Brod | 1 | 2,300 |
| Others | 3 | 950 |
| Total | 4 | 3,250 |

#### BELGIUM

| | | |
|---|---|---|
| Total | 7 | 1,900 |

#### ITALY

| | | |
|---|---|---|
| Trieste | 1 | 1,000 |
| Fiume | 1 | 600 |
| Others | *5 | 300 |
| Total | 7 | 1,900 |

*Three are cracking plants only.

#### SWEDEN

| | | |
|---|---|---|
| Nynashamor | 1 | 1,250 |

#### SPAIN

| | | |
|---|---|---|
| Barcelona | 1 | 700 |
| Bilbao | 1 | 450 |
| Total | 2 | 1,150 |
| **Building** | | |

Spanish Monopoly building a 10,000-bbl. plant at Barcelona and have plans drawn for three more.

#### NORWAY

| | | |
|---|---|---|
| Vallo | 1 | 1,000 |

#### LATVIA

| | | |
|---|---|---|
| Riga | 1 | 300 |

#### DENMARK

| | | |
|---|---|---|
| Total | 2 | 150 |

#### PERSIA

| | | |
|---|---|---|
| Abadan | 1 | 95,000 |

#### JAPAN

| | | |
|---|---|---|
| Niigata | 3 | 7,800 |
| Kanagawa | 2 | 5,000 |
| Tokyo | 2 | 3,750 |
| Yamaguchi | 2 | 3,750 |
| Akita | 1 | 3,300 |
| Hokkaido | 1 | 300 |
| Taiwan | 1 | 200 |
| Others | 2 | 1,250 |
| Total | 14 | 25,350 |

#### INDIA

| | | |
|---|---|---|
| Rangoon | 3 | 21,000 |
| Rawalpindi | 1 | 1,300 |
| Difbol | 1 | 1,000 |
| Komdab | 1 | 1,000 |
| Thilwa | 1 | 500 |
| Total | 7 | 24,800 |

#### IRAQ

| | | |
|---|---|---|
| Khanaquin | 1 | 2,000 |
| Kirkuk | 1 | 150 |
| Total | 2 | 2,150 |

#### EGYPT

| | | |
|---|---|---|
| Suez | 2 | 7,400 |

#### CANARY ISLANDS

| | | |
|---|---|---|
| Santa Cruz de Tenneriffe | 1 | 5,000 |

#### DUTCH EAST INDIES

| | | |
|---|---|---|
| **Java—** | | |
| Tjepoe | 1 | 14,000 |
| Wonokromo | 1 | 2,000 |
| Kapocan | 1 | 500 |
| Klantoeng | 1 | 100 |
| **Sumatra—** | | |
| Pladjoe | 1 | 27,000 |
| Palembang | 1 | 13,000 |
| Pankalan Brandon | 1 | 12,000 |
| Atjeh | 1 | 4,000 |
| **Borneo—** | | |
| Balik Papan | 1 | 35,000 |
| **Ceram—** | | |
| Boela Bay | 1 | 1,000 |
| Total Dutch East Indies | 10 | 108,600 |

#### SARAWAK

| | | |
|---|---|---|
| Miri | 1 | 15,000 |

#### AUSTRALIA

| | | |
|---|---|---|
| Clyde | 1 | 2,300 |
| Lanerton | 1 | 2,000 |
| Newport | 1 | 50 |
| Total | 3 | 4,350 |
| Total foreign | 351 | 1,771,770 |

# Colombian Crude Output Cut 16 Per Cent

## Daily Average for 1931 Averages Approximately 46,000 Barrels Against 55,000 in 1930—Oil Law Uncertainty Continues to Halt Foreign Operations of Companies

Production of crude petroleum in Colombia for 1931 will total approximately 16,790,000 bbls., a daily average of 46,000 bbls., a drop of slightly more than 16 per cent from the 1930 total of 20,075,000 bbls., or 55,000 bbls. per day average, according to estimates of well posted authorities.

The drop in Colombian output is due to the curtailment program put into effect in that country by Tropical Oil Co., subsidiary of Standard Oil Co. (New Jersey) and the only major company at present producing in Colombia. The reduction in crude production is entirely a curtailment and conservation measure, as Tropical has sufficient production developed to yield an output far in excess of 1930 totals, it is said. The smaller flow was accompanied by a drop in shipments, and was paralleled by falling consumption in Colombia, which is supplied largely by the products of Tropical's refinery.

Barring the reduction in producing operations by Tropical, and a compromise agreement reached during the year resulting in the ratifying of the Barcos Concession on a somewhat restricted basis as to acreage, affecting South American Gulf Oil Corp. and its associates, the oil situation in Colombia underwent little important modification during 1931.

### Oil Legislation

The outstanding feature of the year has been the continued inability, or unwillingness, of the Colombia government to get together with foreign oil operators on a working basis on the question of oil legislation, although during the closing quarter of the year it appeared several times that the government was on the point of drastically modifying its attitude to permit of the resumption of exploitation operations by foreign companies.

The Colombian congress has adjourned its 1931 session, however, without effecting the amendments to the oil law which American companies had looked for, and consequently the plans of the foreign operators are still very much "up in the air."

Measures had been introduced in both the Colombian senate and the house this year, designed to amend Oil Law 37 to meet the principal objections of most of the foreign operators, but definite opposition to the proposed liberalization of the oil laws developed, and the proposed amendments were not enacted into law.

Features surrounding the present Colombian oil law which have aroused the strongest criticism among foreign operators in that country are the unfavorable provisions for proving and safeguarding titles and subsoil rights, regulations as to minimum limits to which production can be arbitrarily restricted by government order, storage charges to be paid the operator by the government on stored stocks of government royalty oil, alleged excessive production taxes on oil produced from privately owned lands, arbitrary fixing of pipe line tariffs by the government, and taxes on crude produced and refined in Colombia for domestic consumption.

### American Investments

Present investments of American oil companies in Colombia are estimated at over $130,000,000. The largest investments are represented by the fields and pipe line holdings of Tropical Oil and Andian, both Standard Oil Co. (New Jersey) subsidiaries and both of which are actively operating in Colombia. The other major companies with properties in Colombia, including Sinclair, Standard of California, The Texas Company, and Union Oil Co. of California, are all carrying their Colombian properties at a heavy overhead, with no present returns, and no indication of any early change in this decision.

Tropical Oil Co. recently won two important court decisions in Colombia which are now being closely studied by counsel for the other American companies interested in Colombia, and there is a strong likelihood that one or more of the American companies with holdings in Colombia which they cannot operate under the present law will put their fortunes to the test shortly and endeavor to force a showdown on Oil Law 37 in the Colombian courts during 1932.

With the exception of Tropical Oil Co. and its associate, Andian National Corp., there was little activity in Colombian oil fields this year, the outstanding exception being a small working force which Gulf put into the field following its adjustment of litigation in the Colombian supreme court, affecting the validity of the Barcos Concession. Other large American companies with properties in Colombia withdrew their working forces and closed down field operations entirely, leaving only watchmen for the field properties and the indispensable "listening posts" at the Colombian capital.

### Tropical's Position

Tropical Oil Co., operating the large De Mares concession in Colombia, remains unaffected under the terms of this concession by the provisions of Colombia's national oil law, and this company has now developed an extremely large potential production from its acreage. The operations of Tropical have been well integrated, although the bulk of its crude production moves to refining centers in North America.

Two or three smaller units have withdrawn from Colombia entirely, disposing of their supplies and equipment to companies remaining in the field, and unless some favorable adjustment of the drastic provisions of Oil Law 37 is obtained in the near future, other companies will either continue inactive there or may possibly liquidate their holdings entirely and withdraw from the country.

Even a sweeping readjustment of Colombia's oil regulations during the coming year, however, would have little effect upon Colombian production for some time to come. While the American companies with holdings in that country have completed most of their preliminary geological work, they would be in no hurry to begin producing crude in a large way until adequate facilities could be provided for the transportation of crude to tidewater. This would involve an extensive program of preparation, including the obtaining of river tankers to move oil and the construction of several pipe lines, before drilling crews would be sent into the field to start bringing the oil above ground.

### Venezuela as Example

With the example of its neighbor, Venezuela, before it, the Colombian government has been slow in recognizing the value to national prosperity of an extensive program of crude petroleum development, and its large reserves of oil have lain dormant while petroleum legislation has been the subject for political bickering. The economic condition of Colombia reflects disturbed economic conditions common to many other countries today, while its neighbor, Venezuela, stands alone among nations as a country without a national debt and with extremely light tax burdens for its citizens. Colombian legislators have so consistently refused to extend necessary co-operation to foreign oil companies which have entered their country that Colombia's crude has laid idle at a time when crude markets were at their best, and belated development in Colombia now will bring the crude output of that country on the world market at a time when the world supply of crude petroleum is at an all-time high, and selling prices at an all-time low.

# Talk Petroleum Monopoly in Austria

## Austrian Petroleum Writer Believes Economics of Situation Do Not Justify Intervention. Monopoly Not Successful Elsewhere

Considerable interest has recently been stirred in American oil circles by a proposal advanced in Austria for creation of a government petroleum monopoly. While the plan is still under discussion, nothing definite has yet been forthcoming.

Robert Schwarz, well-known Continental engineer and editor of the Austro-German oil journal "Petroleum," in a recent editorial discussion of the monopoly plan, said:

The persistent reports that a petrol monopoly is contemplated in Austria have caused a considerable sensation in the circles concerned. It is, however, extremely doubtful whether the deliberations in progress in ministerial departments will show monopolistic state intervention in the mineral oil trade to be advisable. For one thing, in those countries which had introduced monopolies or monopoly-like measures of control, there has latterly been a decline of this state influence on oil affairs. Spain, for instance, immediately after the convulsion proceeded to revise the monopoly contracts, and there is every likelihood that the mineral oil companies will be permitted to resume operations.

There has also been a certain curtailing of state control in Yugo-Slavia, where the petroleum monopoly applies only to Serbian territory. Turkey soon abandoned its attempt to introduce a mineral oil monopoly, and in Greece there is also a movement to abolish the monopoly.

The experiments of state interference in the mineral oil industry have altogether achieved but few happy results. It is true that in France where a monopoly-like allocation of imports has been brought about by the procedure of permitting only certain firms to import, refine and distribute definitely fixed quantities of mineral oil products, an important national industry has been thereby created, but there is only a small surplus for the exchequer to be recorded. In the Argentine, a country with a relatively high production of its own, the monopoly idea has also been relegated ad acta.

### Deterding's Visit

The visit of Sir Henri Deterding to Germany has also given rise to rumors that, if a loan were to be negotiated, the German security would be in the shape of a petrol monopoly. It was further asserted that the Shell group would have been prepared, in return for preferential treatment in the supply of petroleum asphalt for Germany, to grant a large loan for road making purposes, as has been done by this concern in other countries. All these projects, however, seem to founder on the view that the state's revenue from mineral oil products can be increased in a much simpler way than by the complicated machinery of a monopoly, which, apart from the necessity of exercising control over imports, would also involve state supervision of the distributing system.

Experience has shown that the state is not particularly qualified for administrative tasks of that kind; there is no doubt that it operates much more expensively than private firms, which, in addition, have the advantage of decades of technical and economic experience in these affairs. The chief obstacle to any projected monopoly is the fact that numerous and costly installations must be provided for the storage, transportation and distribution of mineral oil products, and for refineries, etc., all entailing enormous expenditures. Compensation must be awarded for these installations, of course, if a state monopoly is adopted.

A casual estimate puts the value of the installations in Austria at far beyond 100,000,000 Austrian shillings. How the state could manage to find a sum of that kind, and, after providing for interest and depreciation, still succeed in producing a surplus, certainly presents a pretty problem. To add to the difficulties of the situation, the present prices for petroleum products are so low as to make it a matter of difficulty even for the private companies to operate at a profit. The state could certainly not increase its revenue adequately without considerably raising the price of motor fuels. Once again the burdens on the consumer would become still heavier, and they have already been considerably increased latterly by duties and other dues.

Frankly, it is in the highest degree reprehensible that uneasiness is continually being caused in the Austrian mineral oil trade, as it is obvious that the oil companies are chary of making further investments in view of the constant threats of disappropriation. To make matters worse, a violent struggle is in progress between members of the convention and outsiders. The present state of the world market and the extraordinary difficulties in the Austrian trade indicate clearly that the present time is extremely unsuitable for the introduction of a petrol monopoly.

### Situation in Germany

With regard to Germany: The projects of a petrol or kerosene monopoly which cropped up before the war met with decided resistance and were not adopted. In the meantime there have been technical improvements of all kinds, such as the cracking of heavy oils and the greatly increased yield of motor spirit, the development of the hydrogenation process and the production of artificial petrol from coal and other oils—so that not only must the importation of mineral oil products be taken into consideration, but domestic production as well. On the face of it, therefore, a monopoly would not appear to be a suitable sphere of activity nor a profitable medium for the state, and the rumors may possibly be due to the efforts which are being made to provide further state

(Continued on Page 68)

**Halliburton Oil Well Cementing Company wishes the oil industry a return of prosperity in 1932 and announces its initial contributions to the New Year in the form of the following**

# 3 NEW

## 1. *Full Hole Cementing Device* . . . . . .

**Halliburton has acquired exclusive license from the R. S. M. Company of Houston, Texas, to manufacture, sell and service this highly effective and economical device for cementing combination strings.**

## 2. *Cement Lining for Screens and Perforated Pipe*

**A Halliburton invention allowing thorough washing down of screens and perforated pipe — simple, inexpensive and highly effective in any case where a wash pipe has been used. Very suitable for use in conjunction with the Full Hole Cementing Device.**

# American Units Merge Foreign Interests

## Socony-Vacuum Consolidation During Year and Pending Consolidation of Standard Oil Companies of New Jersey and California Important

The rapid shifting of the foreign petroleum picture during the past year or so has brought drastically to the attention of the American oil industry the necessity for protecting its foreign marketing interests and has been instrumental in two important mergers during the year, that of Standard Oil Co. of New York and Vacuum Oil Co., now consummated, and the linking of Standard Oil Co. (New Jersey) and Standard Oil Co. of California, now in progress. Both of these consolidations will be of far reaching effect upon export volume in American petroleum in future years it is felt in trade circles.

Vacuum Oil Co. has been materially extending its foreign marketing and refining operations during the past several years, and its hookup presented an ideal picture for a linking of its interests abroad with those of the Standard Oil Co. of New York.

Standard Oil Co. of New York has long been in a dominant position in the Chinese market. Socony is well represented with bulk plants throughout China, and maintains a special service, Standard Transportation Co., Ltd., Hong Kong, which handles its marine distribution in China.

The overseas marketing operations of Socony are by no means confined to China, however, "Socony" being a familiar trademark in Japan, the Philippines, Indo-China, Siam, Dutch East Indies, Straits Settlements, Burma, India, Ceylon, Syria, Turkey, Bulgaria, Greece, Australasia, and in South Africa. Subsidiary companies include Standard Fuel Oil Co., Ltd., Great Britain; Socony Proprietary, Ltd., Australia; Standard Oil Co. of South Africa; and Standard Oil Co. of Jugo Slavia. A large and modern tanker fleet operated by Standard Transportation Co. (now Socony-Vacuum Transportation Corp.) has kept the flow of Socony products running smoothly to the far flung marketing outposts of the company.

Vacuum Oil Co. has brought to the new Socony-Vacuum Corp. an integrated foreign organization which has dovetailed perfectly with that of the old Standard Oil Co. of New York, and has rounded out the foreign operations of the new company on virtually a world wide scale.

### Distribution of Lubricants

Vacuum's distribution of its lubricating specialties for many years has been practically world wide. Besides these extensive marketing facilities, the company, directly and through subsidiaries, maintains refineries and compounding plants in Australasia, Ontario, Canada, Egypt, South, East, and West Africa, and in various parts of Europe. Refineries have been built during the past few years at Budapest, Hungary; Hamburg, Germany; Kolin, Czechoslovakia; Czechowice, Poland; and at several points in France, and the Vacuum company is now marketing a general line of refined products abroad. In addition, Vacuum is erecting a modern refinery in Australia, with daily throughput capacity of 5,000 bbls. of crude, and equipped for the production of a complete line of refined products. The company also has a large modern bulk terminal at Wellington, New Zealand, with storage capacity for 1,500,000 gallons of gasoline and 150,000 gallons of kerosene, and a package plant and storehouse for lubs, supplemented with a number of smaller bulk plants scattered at strategic points throughout the interior of Australia.

Foreign marketing operations of Socony and Vacuum are now being consolidated, in consummation of the recent merger of the parent companies, and it is expected many important operating economies will be effected, putting the organization in much better position to hold its own against the intensified competition now afforded by Russia, Rumania, and other competing nations.

While the foreign marketing subsidiaries of the Socony-Vacuum Co. will be supplied mainly from the United States, and from foreign producing properties and refineries of the two companies, Russian refined products will still be marketed at points where a freight advantage makes the Russian products more economical to handle. In this connection, it is recalled that Standard Oil Co. of New York some time ago, prior to ratification of its merger with Vacuum, contracted with the Soviet for delivery of 1,000,000 bbls. of refined oil over a period of years. This contract is not expected to run out until 1934, indicating that Russian products (kerosene in particular) will continue to play a prominent part in some of the phases of the foreign marketing operations of Socony-Vacuum.

### New Jersey-California

The Standard Oil Co. (New Jersey)-Standard of California merger, which is still "in the making," will create the largest oil organization in the world, and will likewise have an important bearing upon the foreign market situation.

The New Jersey company has important foreign marketing interests. Its subsidiaries include a numerous group of units for marketing or combinations of producing and marketing functions in foreign countries. Standard Oil Export Corp. was formed by the New Jersey company in 1928 to direct its export operations, handling the export business of four main units in the New Jersey group. Standard Oil Export early last year, through an exchange of its preferred

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# Competition Cuts U.S. Sales to Britain

## Rumanian Shipments to Great Britain Up 133 Per Cent First Six Months of 1931. Competition in Fuel Oil Forces U. S. Market to Record Low Level

Sales of American gasoline, kerosene and fuel oil in Great Britain have fallen off substantially this year, due to the sharp competition furnished by Russia and Rumania, both of which showed sharp increases in gasoline sales in that country. Rumania in particular has been an important factor in declining sales of American refined products in Great Britain, its shipments of all of the major refined products to the British market having recorded substantial gains during the current year. Rumania's virtual dumping of surplus refined products in Great Britain has likewise reacted to the disadvantage of Soviet marketing groups in Great Britain.

Detailed data covering imports of refined oil into Great Britain from the United States, Russia and Rumania during the first six months of the year show that American interests lost heavily in their volume on major products. Data for the full year, naturally, are not yet available, but the half-year's results, it is believed, are fully representative, from a percentage standpoint, of the operations for the year which is about to close.

### British Imports

Imports of refined petroleum products into Great Britain from this country, Rumania, and Russia, with comparative data for the comparable months of 1930 and figures showing the percentage of the United Kingdom volume handled by each country, follow:

| | Rumania | | | | Russia | | | | United States | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan.-June, 1931 | | Jan.-June, 1930 | | Jan.-June, 1931 | | Jan.-June, 1930 | | Jan.-June, 1931 | | Jan.-June, 1930 | |
| | 1,000 gallons | Pct. of U.K. trade | 1,000 gallons | Pct. of U.K. trade | 1,000 gallons | Pct. of U.K. trade | 1,000 gallons | Pct. of U.K. trade | 1,000 gallons | Pct. of U.K. trade | 1,000 gallons | Pct. of U.K. trade |
| Motor spirit | 56,675 | 12 2 | 25,743 | 4 9 | 72,135 | 15.2 | 61,010 | 11 6 | 202,704 | 43 6 | 281,270 | 53.7 |
| Kerosene | 22,098 | 16.0 | 9,922 | 9 1 | 37,752 | 27 3 | 33,197 | 30 4 | 41,553 | 30.1 | 37,580 | 34 3 |
| Gas oil | 7,444 | 20 1 | 2,083 | 3 4 | 1,827 | 4 9 | 8,075 | 13.1 | 16,667 | 45 0 | 26,744 | 43 3 |
| Lubricating oil | .... | .... | 843 | 1 5 | 5,966 | 13 5 | 8,442 | 15 2 | 33,534 | 76.1 | 36,294 | 65 4 |
| Fuel oil | 6,465 | 2.6 | 3,613 | 1 8 | 24,232 | 9.8 | 24,345 | 11 8 | 4,644 | 1.9 | 29,672 | 14 5 |

Note—The above figures, taken from British customs figures, are in Imperial gallons.

Total shipments of all refined products into Great Britain by United States refiners during the first half of the current year amounted to but 299,102,000 gallons, as compared with shipments of 411,560,000 gallons in the first six months of 1930. The share of the United Kingdom petroleum trade handled by American interests in the first six months of the current year was 31.8 per cent, a material drop from the 43 per cent during the comparable months of last year.

### Rumania and Russia

Rumania, on the other hand, has sharply increased its shipments into Great Britain, increasing its participation in Great Britain's oil trade from 4.4 per cent in the first half of 1930 to 10.5 per cent in the similar period of 1931. Shipments of Rumanian products into England in the first six months of the current year aggregated 98,527,000 gallons, an increase of 133 per cent over the 42,205,000 gallons supplied to the British market by Rumania in the first six month of 1930.

Russia, along with the United States, has suffered from the mushrooming of Rumania's oil trade in Great Britain, although the Soviet recorded an increase in its volume during the first half of the year, with total shipments of 141,913,000 gallons of all products into Great Britain, as compared with 135,069,000 gallons in the first half of 1930. Russia, likewise, increased its importance in Great Britain, accounting for 15.1 per cent of the total trade in petroleum products during the first half of the year, as contrasted with 13.6 per cent in the similar months of 1930.

### Drop in Fuel Oil

While the sharpest decline in American shipments into Great Britain, from the standpoint of actual gallonage, occurred in gasoline, with shipments of 202,704,000 gallons in the first half of 1931, against 281,270,000 gallons in the corresponding months last year, the pronounced drop in American fuel oil shipments to Great Britain has reacted most seriously against the American market. In the first half last year, American fuel oil accounted for 14.5 per cent of the business in Great Britain, shipments totaling 29,672,000 gallons. In the corresponding months this year, American shipments were off to 4,644,000 gallons, and American fuel oil accounted for but 1.9 per cent of the business in this oil in Great Britain. This sharp drop in fuel oil shipments, together with the presence of large quantities of Russian and Rumanian fuel oil on the British market at unusually low prices, has been responsible for driving fuel oil prices at American Atlantic ports to the lowest level in the recorded history of the industry.

Major integrated American companies with refineries and bulk plants along the eastern United States seaboard dispose of large quantities of their fuel oil production to transatlantic steamship companies. In former years, this business has been pretty well "lined up" by the American companies, although some of the business at British ports, naturally, was handled by British interests. With Russian and Rumanian fuel oil available in ever increasing quantities in Great Britain, however, and with the sellers of these oils willing to undersell American refiners to cut into the marine markets, regardless, apparently, of how low the American market went, the American companies have been at a disadvantage throughout the year.

### Bunker Fuel Competition

Steamship lines which formerly bunkered their vessels at American ports, often taking on enough oil (at Boston, New York or Philadelphia) for the round-trip voyage, have in some instances reversed this procedure, and are now doing the bulk of their bunkering at British ports, taking on Russian or Rumanian fuel oil in sufficient quantities for the voyage eastward and in some few cases bunkering sufficient oil for the round-trip passage. Thus, American companies have been deprived of considerable of this marine business, and although current bunker oil prices at East Coast United States ports are at the lowest levels in history, price competition in the British market has not ceased, and the outlook is still uncertain.

A world accord for the balancing of crude production with consumption, now proposed, would undoubtedly tend to correct in some measure current conditions in the bunker fuel market in Great Britain, although such an accord would not fully rectify these conditions unless the co-operation of the Soviet could be secured in a world cartel, and at this writing the possibility of such co-operation appears remote.

The only other ray of hope for the American refiners in this situation is

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# France Prospecting Colonies for Oil

## Carries on Exploration Work in Many Countries in Effort to Develop Supply of Crude Petroleum, Aside From Iraq Holdings

While the extensive refinery construction program now under way in France is built upon the expectations of an adequate supply of crude petroleum from the French share of the Iraq oil fields, the French government, in co-operation with various French oil companies, is vigorously prosecuting the search for oil in numerous French colonies, and is steadily pressing its efforts to build up a diversified source of crude oil for its refineries.

M. Ch. Bihoreau, subdirector of the technical services of the Office National des Combustibles Liquides, in a recent address in Paris, detailed the search for oil in French colonies in a comprehensive summary.

France's petroleum consumption is steadily growing, M. Bihoreau said, having increased from 3,000,000 tons in 1929 to 3,350,000 tons in 1930, with this rate of increase expected to be maintained for some time. Practically all of France's requirements are taken care of by imports, which is considered an uneconomic practice in normal times and a source of national danger in time of war. Domestic production, he said, supplied but 2 per cent of the total consumption in France, consisting of between 70,000 and 75,000 tons of crude from Pechelbronn, 2,000 tons from Gabian, and approximately 4,000 tons of shale oil. Intensive research in France, he added, has proved that early optimistic hopes of the Gabian Field were extremely unlikely of fulfillment, leaving Pechelbronn as the only oil pool of importance in all of France. Realizing the need for development of an adequate supply of crude, the Office National des Combustibles Liquides has been co-operating with the colonial governments and others in research work in Martinique, New Caledonia, Equatorial Africa, Madagascar, Tunis and Morocco.

Reviewing the results of this exploration work in detail, M. Bihoreau said:

### Martinique

The only indisputable showing of oleiferous matter consists of asphalt among the rocks and shingle of the southern and eastern seaboard. One anticline has been located, which might merit attention; traces of hydrocarbons were encountered in a 55-meter hole drilled for water in 1926, a film of oil was observed on the sea in August, 1927, but no importance is attached to these indications. Exploration is not being persevered with, and will only be worth while if the other showings are reported.

### New Caledonia

A few wells drilled by two syndicates between 1908 and 1916, on a stream in the Koumac district, showed that gas and traces of hydrocarbons were present, but operations were suspended in 1919 owing to inadequate technical and financial resources. A report on the possibilities by an officially appointed geologist, however, will probably be available shortly.

### French Equatorial Africa

Certain place names, such as Pointe Noire and Walha-le-Bitume, are derived from the occurrences of bitumen which have long been known to exist on the West Coast of Africa, from the Ivory Coast as far as Angola. A geological survey by M. Lebedeff, a diploma engineer of the French National Petroleum College, which was published in August, 1930, states that there are showings in four zones: Pointe Noire, Poumbou, Rembo N'Komi and N'Kogho. There are numerous seepages of heavy oil in quarries at Pointe Noire; the product contains no fractions distilling below 300 degrees and very little asphalt, showing it to be an oxydized oil, of which the light constituents have evaporated. Around Poumbou, there are pools of oil on the surface of the streams, produced by seepage from the sandstone forming the banks. On the Tembo N'Komi, a proportion of oil is found in water issuing from circular cavities on the banks; this oil is particularly fluid and contains no asphalt—it is also a heavy oil no longer containing any light fractions. In the fourth zone, around N'Kogho, the seepages of petroleum have produced extensive beds of bitumen.

Although the various products probably emanate from different geological formations, it is worthy of specific mention that the Lower Cretaceous contains alternating layers of porous material and impermeable clays favorable to the accumulation of oil, and that the structures consist of gentle undulations which have not been subject to any great dislocation. Topographical and geological investigations are in progress, to indicate suitable sites for drilling.

### Madagascar

Showings of oil have been reported in Madagascar since 1897, but no exploration took place until 1909. By 1919, 13 holes had been drilled, 7 in the Folakara district, and 6 in the Maroboaly district, but although a total of 5,000 meters was drilled and several of the wells carried down to 700 or 800 meters, no oil was found. These negative results may be due to bad placing of the holes, all the sites being in the immediate vicinity of large masses of flat bituminous sandstone, without regard to the geological structure, which, however, does not appear to present any important anticline. There are enormous masses of these bituminous sandstones in the Triassic formation in the districts of Morafenobe-Homolonga-Bedoa and Folakara-Maroboaly, and they represent the relics of a gigantic petroleum deposit; they are oil sands denuded by erosion, from which the oil has disappeared under atmospheric influences, and in which the bituminous residue forms the cementing material.

Attempts to exploit the bituminous sands as such failed on account of the cost of extraction. Analysis of the oil obtained by dry distillation showed a yield of 8 to 9 per cent of gasoline, 12 per cent kerosene, 12 per cent gas oil and 60 per cent heavy oil, the remaining 8 per cent being accounted for by gas and coke. There are, therefore, few light fractions, but it was hoped the heavy oil could be used as Diesel fuel, for the production of lubricants, or for conversion into motor spirit by cracking. As already mentioned, however, the difficulty was to find an economic method of extraction. Numerous methods, including the Canadian, all proved unsatisfactory, and it seems that the bitumen can be used only for the upkeep of the roads. It should be pointed out that the bituminous sands of Alberta in Canada contain 18 per cent of bitumen, whereas the Madagascar content does not exceed 10 per cent.

Efforts are to be made to discover whether there are any uneroded deposits in the sandstone, or any anticlines. One anticlinal structure, in fact, has already been located, and a hole is to be drilled early in 1932 in the neighborhood of Andrafivelo. Prospecting in Madagascar will demand time and money, owing to the many local obstacles; disembarking facilities are most primitive, the roads are mere paths and are impassable during the rainy season. The program provides for the drilling of six to eight wells over a period of five or six years, and in the most favorable circumstances it will be three or four years before any definite data are available.

### Tunis

Signs of oil are reported from three districts; Kefbou-Debbous near Teboursouk, Slouguia, and Ain-Rhelal. At Kefbou-Debbous, there is some oil in a salt water spring at the bottom of a steep ravine. A Belgian company, instead of drilling here on the advice of an oil geologist, transferred its operations to a site indicated by a diviner near Medjez-el-Bab, and ultimately abandoned the hole carried down to 709 meters without result. At Slouguia, 20 kilometers to the east of Kefbou-Debbous, there is soft sandstone impregnated with bitumen. An English company drilled a hole of 127 meters between 1911 and 1914, and found a little oil at a depth of 55 meters. This well was dynamited by a French company in 1919, and 200 liters of oil was obtained for a short time. Other shallow wells in the vicinity produced gas and traces of oil. Geological study shows the holes to have been badly placed, and another site has just been agreed on between the Protectorate and the O.N.C.L. At Ain-Rhelal, south of Lake Bizerte and east of the Mateur plain, a hand-dug well of 72 meters gave a little oil, a deep hole of 800 meters drilled in 1920 and 1921 remained dry; the site, however, was badly chosen. Apart from the areas referred to, Americans drilled down to 1,540 meters at Cape Bon without result, but their operations were based on American and not Tunisian geological theory.

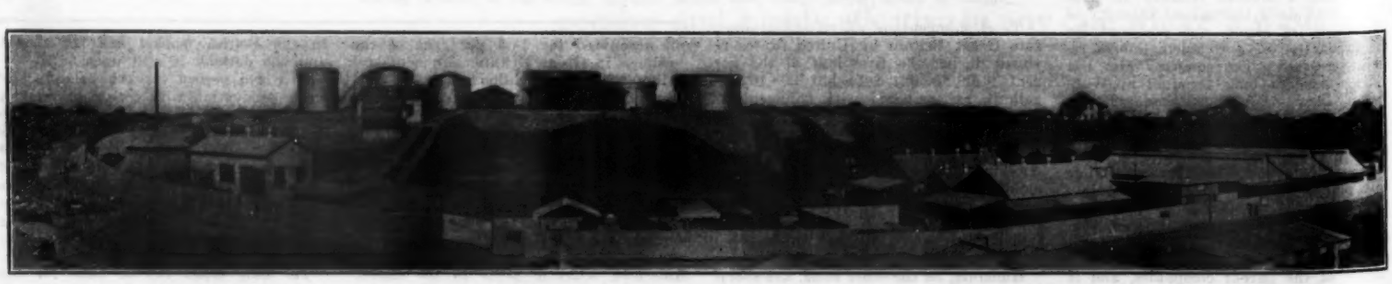
No results have been obtained in Tunis, but more care should have been taken in selecting sites. Whether the well to be drilled at Slouguia yields oil or not, it will furnish valuable geological data.

### Morocco

Numerous seepages have long been known in the Sebou Basine (particularly in the Tselfat) and in the Rharb, occurring over 200 kilometers of ground between Larache and Fez. A number of holes have been drilled since 1918; most of them are flooded, but 50 to 100 tons of oil a year are obtained from 15 wells not exceeding 210 meters at Tselft, and a small production from one of several wells in the Rharb. Following geophysical examination, four deep wells are at present being drilled, at Ain el Hamra and Sidi bou Mlid (both by the O.N.C.L. and the Protectorate in collaboration with the Compagnie Francaise des Petroles and other companies), Karia Jraifi, and on the Bellot peak near Fez. Caving of the strata from 400 meters onward is giving great trouble at Ain el Hamra, and as the Miocene has not yet been fully drilled through, no conclusive data have been obtained so far. Traces of oil and gas were found at 552 meters at Sidi bou Mlid, and at 660 meters at Karia Jraifi. The hole on the Bellot peak near Fez is sited on a well-defined Miocene dome, but has reached 788 meters without finding oil.

### Conclusion

"Operations are not far enough advanced," M. Bihoreau concluded, "to warrant the hope that some day one or another of the French colonies will occupy an important place among the oil producers of the world. Conditions in certain areas justify methodic search, and it is hoped that the work of prospecting undertaken by the O.N.C.L. with the support of the governments of the colonies and protectorates will eventually secure a measure of independence in the mother country's oil supply. Time and money, patience and perseverence, will be required until definite results, positive or negative, are obtained. Deposits producing millions of tons in other parts of the world were developed only by the tenacity of pioneers who would not be discouraged, and to whom failure was but an incentive to further effort, till final success was achieved."



*A view of the installation at Mombassa, South Africa, of the Vacuum Oil Co. of South Africa, Ltd.*

# Standards for oil, gas, water, air, and steam service

FIG. 375
Bronze Gate Valve

FIG. 1444
I. B. B. M. Gate Valve

FIG. 102
Bronze Globe Valve

Series 1500
Cast Steel Gate Valve

Series 600
Cast Steel Globe Valve

Series 400
Cast Steel Swing
Check Valve

Powell Valves are designed and processed to be oil and gas tight. Their adaptability to dependably meet and satisfy pipe line and refinery needs accounts for the popularity of Powell Valves throughout the Oil Industry

Powell Products include bronze, iron, and steel Globe, Angle, Check, Gate and Safety Valves; also Oilers, Lubricators, Grease Cups, Gauges, and other equipment for oil country service. They are distributed by jobbers in all oil sections.

THE WM POWELL CO
2521-31 Spring Grove Avenue Cincinnati, Ohio

# POWELL VALVES

# Russia Now Second Largest Producer

## Estimated Production of 157,000,000 Barrels for 1931 Puts Soviet Ahead of Venezuela. Refining Operations Broadened. Five Year Plan Lags

Russia attained second place among the world producers of petroleum during 1931, displacing Venezuela, and with reports from the U.S.S.R. indicating an intensified exploration and exploitation program for 1932, it appears evident that Russia is now in second place to stay for some time to come. While official statistics are lacking, it is indicated that the total crude output of the Soviet for 1931 will approximate 157,000,000 bbls., an increase of some 22,000,000 bbls. over 1930 production. In 1901, Russia was the world's leading producer of petroleum, giving place to the United States in the following year, and holding second place until 1918, when it dropped to third, holding that place, with the exception of one year, until 1931, when it again goes into second place.

Accurate data on the number and size of Russian refineries are lacking, but it is known the Soviet has been materially expanding the country's refining capacity, and that a number of new, large and modern plants are now being operated by the Soviet, with construction of additional units planned. Unofficial reports place Russia's refining capacity at about 400,000 bbls. daily, with plants operated at about 90 per cent of capacity. Improvement in refining technique in Russia has been reflected by an increased yield of gasoline, which for the year 1931 is placed at 18 per cent, against 14 per cent in 1930.

More than half the Russian refining capacity is centered at Baku, with Grozny and Batoum, the Black Sea terminal of the Baku pipe line, ranking second and third, in the order named. A number of plants are also operated at Tuapse, the tidewater terminal of the pipe line from Grozny. Several small refineries are operated at interior points, and the Soviet is reported planning a large refinery for the Islands of Sakhalin, which is handier to many world markets than existing Soviet tidewater plants.

### Russian Consumption

Daily average consumption of crude in Russia last year, including bunkers, approximated 276,000 bbls., leaving a sizeable exportable surplus.

Conflicting reports have come out of Russia this year regarding the progress made in developing new crude production. The Soviet's refinery program has apparently been predicated on the theory that Russia possesses a limitless reserve of crude, but unofficial reports seeping out of Russia during the past few months have indicated that the refinery expansion program might be slowed down while efforts of the Soviet's oil authorities were made to swing over to the production side of the picture. A number of new oil areas, of which promising geological reports had been received, have apparently failed to yield the expected supplies of crude, and with the old field being produced to capacity, early exhaustion of some of the more prolific producing sands is feared. Considerable censure has been directed by Soviet authorities at the direction of the prospecting work of the oil trust, and present reports are to the effect that this branch of the Russian oil industry is to be entirely reorganized.

### Azneft's Operations

Azneft, operator in the Baku area, was scheduled to produce 15,000,000 tons of crude during 1931, but is expected to be behind this total when the year ends. Total output of Azneft for the first six months of the year was 6,400,000 tons, a total of 538,000 tons less than the scheduled output, but nevertheless 25 per cent ahead of the production for the corresponding period of 1930. While later reports are lacking, it is not expected that the half year's deficiency has been made up during the closing half of the year—on the contrary, further losses are expected. The drilling program for the first six months was considerably behind schedule, and a number of productive wells were forced to shut down, due to lack of equipment and faulty management. Azneft was scheduled to complete 335,000 meters of drilling in the first six months of the year, but actually completed but 254,000 meters.

Azneft's refining program made a better showing than its production attainments, however. A total of 4,583,000 tons of crude were processed during the first half of the year, which was 98.4 per cent of the scheduled throughput of 4,656,000 tons. This was an increase of 21 per cent over Azneft's throughput in the first half of 1930. The failure to attain the full refining schedule was attributed to shortages of Surakhani lubricating oil and Bibi-Eibat crude, and insufficient percentage production of light products.

An interesting feature of operations in the Baku region this year has been the deeper drilling in the Surakhani Field. Most of the production from this field has come from the fifth level, but the Soviet tapped the sixth level with encouraging results this year, and three more horizons remain for the drill.

### Export Situation

Russian oil has attained a definite place in world oil markets, and the marketing operations of the Soviet were carried on in a fairly orderly manner this year, with a minimum of disturbance to other existing channels of distribution. The Soviet invaded the East Coast South American market in a small way during the year, and also expanded its operations in China, South Africa and a few other markets, but its marketing activities were not characterized by the drastic price cutting practices of former years. Whether this marks a change of policy on the part of the Soviet, or was due to the fact that Rumania and the Gulf had already forced world oil levels to record low levels, remains uncertain. At the height of the price war between Rumanian and Gulf sellers in the spring, Russia was credited with having informed its buyers that it would meet any price named by either Rumania or the Gulf, but this was nothing beyond what world oil marketers were doing.

Total exports of Russian oil for 1931 are expected to approximate 5,000,000 tons, representing a fair increase over the 4,626,000 tons exported in the fiscal year 1929-30 and the 3,622,000 tons exported in the fiscal year 1928-29. In 1921-22, the first years in which Soviet marketing activities outside of Russia attracted world notice, Russia shipped but 154,000 tons to foreign markets.

### Oil Financing Development

The Soviet is basing a considerable part of its industrial expansion program on the ability of its petroleum industry to bring in the revenue needed to finance this development. Under the terms of the Soviet expansion plan for the Russian oil industry, Russia will be called upon to furnish world markets 8,500,000 tons in 1933. Considering the constantly growing domestic requirements in Russia, as motorization and mechanical equipment increases, as well as the failure of the crude production of Russia to reach expected totals, competing oil interests are inclined to doubt that the terms of the five-year plan, so far as the petroleum trade is concerned, will be fulfilled.

While Russia has been increasing her exports from year to year, it is pointed out, the rate of increase has slowed down considerably in the last few years.

The plans of the Soviet for crude production call for an increase of 7,800,000 tons this year over 1930 production, an increase of 8,500,000 tons over 1931 in 1932, and an increase of 11,000,000 tons over 1932 in 1933, the culminating year in the five-year plan. Reports as to the present progress of production activities in Russia indicate that this is the weak link in the Soviet petroleum chain, and that barring an entirely unforeseen spurt in field operations and results, Russian production will fall far short of the expected totals.

### Fall Short in Drilling

Russia's producing and refining activities are centered in four trusts, "Azneft," "Groznefť," "Maikopneft" and "Embaneft." These four trusts, under the terms of the five-year plan, were scheduled to bring aboveground 26,540,000 tons of crude. During the first three quarters of the year, production attained but 16,471,000 tons, and final figures, taking in the results of the closing quarter, are expected to show a sizable deficiency. This bogging down of the production schedule, in view of the arbitrary production increases decreed for 1932 and 1933, threatens to entirely disrupt the Soviet's oil development plan. The four trusts under the terms of the plan were to accomplish 970,000 meters of drilling for the full year 1931, yet up to June 30 had drilled but 379,000 meters.

### Transport Difficulties

Another apparently unforeseen drawback to the Soviet's ambitious development plan has developed in the transportation system of the Soviet's oil industry. The two Baku-Batoum pipe lines are credited with joint capacity of 2,250,000 tons a year, and the Grozny-Tuapse line with annual capacity for 1,500,000 tons per year, leaving a considerable quantity of crude to be moved by rail to refining centers. Recent reports from Russia have stressed the difficulties encountered in the operation of Russia's main line railroads, and considerable furore was raised in Russian oil circles in midsummer by a virtually complete breakdown in the waterway transportation of refined products to interior markets.

Some progress has been made by the Soviet in building up its fleet of ocean-going tankers, and the Soviet is now enjoying the lowest rates in the history of the shipping industry in the chartering of tankers to move its refined products to world markets.

### Summary of Situation

An interesting summary of the present position of the Russian oil industry by Prof. N. J. Avnatamoff, prominent oil authority, appeared recently in London Petroleum Times. In summing up the situation, Professor Avnatamoff says:

"The stabilization of Soviet oil exports at the very moment when they begin to acquire firm footing on foreign markets and when the other countries began to believe in its 'steadiness' represents the breaking down of the imposing work pursued by the Soviets throughout these years in view of the establishment of firm oil commercial relations with other countries and proves that all sacrifices made by the Soviets in view of these relations were made in vain. With this stabilization of oil exports, prospects of an execution of the five-year plan in this industry, projects of an establishment of a large network of oil-trading centers on foreign markets, and of the creation of a powerful tanker fleet on the seas, become here unattainable dreams. The stabilization threatens the Soviet oil industry altogether, as it will diminish the possibilities for the import of foreign technical equipment and will thereby disorganize the Soviet oil refining industry, which was beginning to develop and which devoted its efforts to the treatment of raw materials.

"The catastrophical importance of this stabilization of oil exports will be the more clearly realized if we recall that the oil products exported by the Soviets represent—according to statements made by the Soviets themselves—'political goods which carry the importance of oil export from the Soviet beyond the framework of purely commercial interests.'

"The Soviet leaders fully understand and realize the future results which may derive from the above mentioned changes. However, the development of drilling, of extraction and of transportation require the investment of very large capital which is not at the disposal of the Soviet at present. Therefore, there arises before the Soviet the always present problem of a search for capital abroad."

### Obstacles Abroad

Russia, like the United States, is confronted with the possibility of a tariff wall against her refined products in the United Kingdom, which is now one of the principal export markets for Soviet gasoline and kerosene. As is likewise the case with the United States, the Soviet's position in France is jeopardized by the program of refinery development undertaken by the French government. In other world markets, however, Russia has succeeded in further extending its operations during the current year. In each country in which Russian gasoline and other products are marketed, the Soviet has followed the policy of centralizing sales through one directly controlled company, or through an organization handling Soviet oil exclusively, and its marketing program has likewise involved the establishment of large marine terminals in each country where large scale selling operations are conducted.

While considerable of the equipment and technical direction of the newer Russian refineries has come from the United States, indications are that 1931 marked the end of large scale purchasing operations of refinery equipment outside of Russia. Manufacturing facilities have been developed by the Soviet whereby the machinery and equipment requirements of the Soviet refining industry can henceforth be supplied largely with products of domestic manufacture. Soviet technicians are reported to have made considerable progress in the development of cracking operations in advanced form, and the newer forms of petroleum processing as developed in the United States and elsewhere will henceforth be supplemented in Russian refineries with methods developed by the Soviet's scientific staffs.

Russia was not a seller in the United States market during the current year, although the success of Rumania in competing with American refiners in sales in the American bulk market is known to have aroused considerable interest in Russia. A report last month from Amtorg, quoting the head of that organization, stated definitely that Russia was not contemplating the shipment of any refined petroleum into the United States. Only one Russian petroleum cargo has reached this country in recent years, and the marketing of that one shipment, which came in at Baltimore, was not a success.

## TO DRILL IN PERSIA

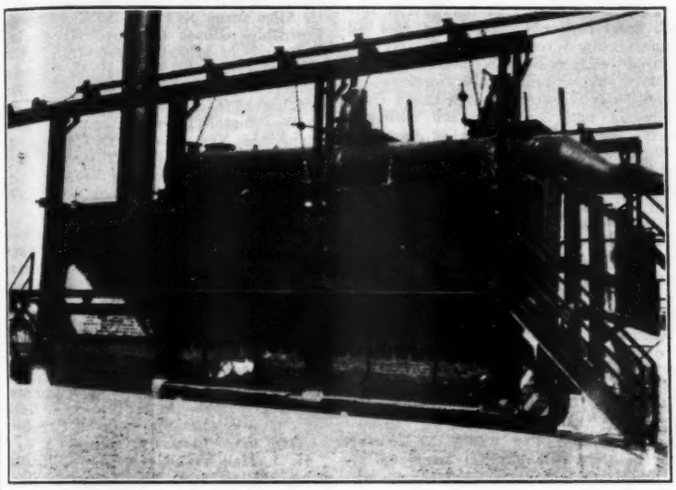
Four American technicians and 500 tons of oil well drilling supplies recently landed at Bahrein, Persia, where an effort will be made to open important oil deposits believed to exist in that district, according to Vice Consul A. L. Richards, Teheran, in a report made public by the Commerce Department. The Sheikh of Koweit granted his permission to this activity after prolonged negotiations.

# Aguila Builds Refinery and Pipe Line

## Mexican Subsidiary of Shell Group Completes 10,000-Bbl. Plant Near Mexico City. Unique Pipe Line System

Mexican Eagle Oil Co. (El Aguila), Mexican subsidiary of the Royal Dutch-Shell group, has made intensive plans for developing the Mexican market for refined products, involving the construction of a large modern refining center near Mexico City and the building of a pipe line, running from close to sea level to the highest point in the world where a refinery is located.

The new pipe line, now under construction, is of 10-inch pipe, and runs from El Aguila's Furbero oil field, situated on the Gulf Coast, to the company's new refinery at Atzcapotzalco, just outside of Mexico City. The line, which runs a distance of 230 kilometers, starts at a point 96 meters above sea level and crosses the mountains to its terminal, where it attains a height of 2,244 meters.



*View of new type coke ovens.*

Construction of the pipe line has presented many difficulties not ordinarily encountered in pipelining, due to the heavy rains common in the region which the line traverses and also because of running the line over the mountain range encircling Mexico City. At one point an elevation of 2,600 meters above sea level is touched. The line is equipped with seven electrically driven pump stations with a working pressure of up to 800 pounds per square inch. These stations have all been completed, and it is expected that the entire new pipe line system will be in operation by January 1, 1932.

The new Aguila refinery, which is the highest in the world, consists of a complete unit capable of refining about 10,000 bbls. daily, and also a plant for the manufacture of up to 250 tons of asphalt daily. This latter plant, as also the fractionating unit at the refinery, were designed by the Badger company. In addition to this equipment, the company has installed a plant for manufacturing 30 tons of coke daily, and is at present considering the installation of a briquetting plant, vapor phase cracking plant and wax plant, these latter being dependent upon the requirements of the trade. The refinery is fully equipped with loading racks, etc., for handling tank cars and tank wagons, and is supplemented with houses for employes and also facilities for recreation.

Refining operations of El Aguila, in connection with its new plant, will be somewhat out of the ordinary routine. Due to the peculiar requirements of the trade which the new plant will serve, the company will partially refine crude oil at its Tampico refinery, and pump to the new refinery at Mexico City a synthetic crude containing the various products in the proportions required for the market. This synthetic crude will be received into four 55,000-bbl. tanks, from which it will be taken by suction and pumped through a series of heat exchangers in counter-flow to the residue and reflux from the Badger topping unit. The oil then enters the Badger heater, which is fired by six National Airoil burners, and after being heated to about 255° C. in passing through the convection and radiant banks of this heater the oil enters near the bottom of the Badger fractionating tower, from which gasoline, kerosene and gas oil cuts are taken off. Water for condensing and cooling these fractions is supplied from three wells which have been drilled to depths of 40, 90 and 120 meters, respectively, the water being pumped by means of centrifugal deep well pumps, or by air lift if necessary, to a concrete reservoir. The hot water is flowed back to the reservoir, being discharged through spray nozzles by which means it is cooled to such an extent that only a small makeup, approximately 5 per cent, is necessary from the wells.

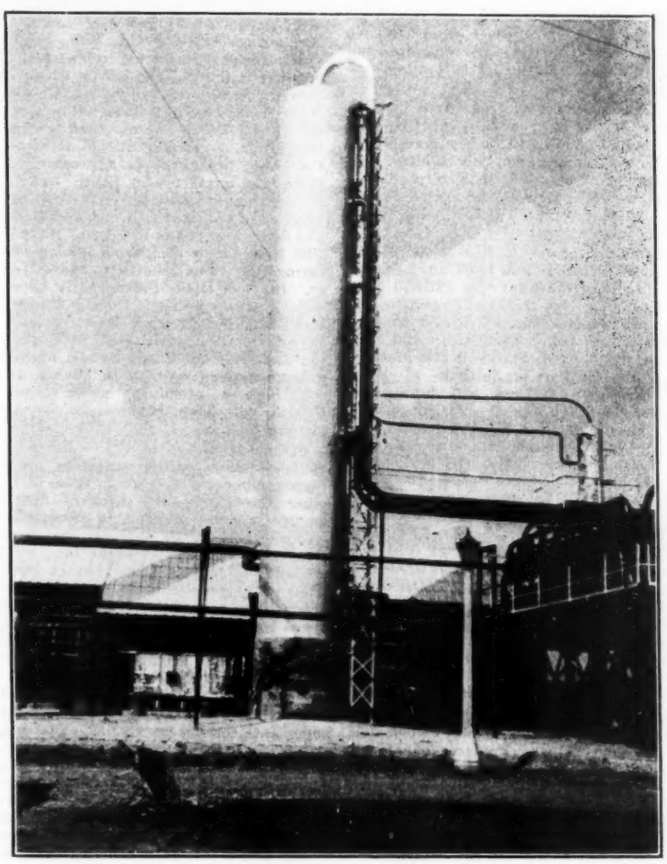
The bottoms from the topping tower are pumped in part to fuel storage, the balance being pumped through the convection and part of the radiant section of the asphalt pipe still, where it is heated to approximately 800° F. (427° C.) and charged into the asphalt tower. The exact temperature to which these bottoms are heated in the asphalt furnace depends, of course, on the grade of asphalt which it is desired to produce. Steam is blown into the base of the tower and comes into contact with the liquid in various stripping plates, gas oil being taken off overhead and the bottoms recirculated through the remaining radiant sections of the pipe still and then passed through a circulating line from which the required amounts to be charged to the coke ovens are withdrawn. The coke ovens were manufactured by the Brassert Tidewater Co., and the operation is very similar to that covered by the article in The Oil and Gas Journal of September 10, last, under the heading "Tidal Refining Co. Making High Quality Coke in Knowles Unit."

El Aguila has long been one of the outstanding petroleum companies in Mexico. Incorporated August 31, 1908, in Mexico, the company subsequently acquired the properties, oil concessions and interests in Mexico of S. Pearson & Son, Ltd. In 1922 the company purchased all the assets and properties of Oil Fields of Mexico Co., including freehold lands and subsoil rights, railway line, pipe line etc. Aguila subsequently formed the Eagle Oil Transport Co., Ltd., to build and operate tank vessels to transport the products of El Aguila's Mexican plants to world markets. It also acquired an interest in Anglo Mexican Petroleum Co., Ltd., through which agency products available for export from Mexico are marketed. On December 1, 1929, Aguila acquired the entire capital stock of Compania Mexicana Holandesa "La Corona" S.A. El Aguila is affiliated with Canadian Eagle Oil Co., Ltd., to which in 1928 it turned over more than half of its assets outside of Mexico in exchange for stock in the Canadian company.

In addition to the new refinery and pipe line, properties of El Aguila include state concessions in many parts of the states of Vera Cruz, Tabasco, Chiapas, San Luis Potosi and Tamaulipas, and federal concessions over the greater part of these states. At last reports, the total freehold and leasehold properties amounted to approximately 1,600,000 acres, exclusive of the rights from the government.

Most of the company's bulk storage is located on freeholds at Vera Cruz, Tampico and Tuxpam. Pipe lines operated by the company have daily capacity of 150,000 bbls. In addition to the new plant, refineries are located at Tampico and Minatitlan, with 90,000 and 15,000 bbls. daily capacity respectively. A topping plant at Tuxpam, with a daily capacity of 25,000 bbls., is also owned by the company.

El Aguila has built up an important domestic marketing organization in Mexico, and operation of its new plant near Mexico City will enable the company to further expand its activities in this direction.



*Topping unit at new refinery of Mexican Eagle Oil Co. located near Mexico City.*

**SUMMARY OF STATEMENTS MADE DECEMBER 10, 1931, RELATING TO BUSINESS OF VARIOUS PIPE LINES FOR MONTH ENDING NOVEMBER 30, 1931**

| | Gross stocks | Runs from wells | Other receipts | Regular deliveries | Other deliveries |
|---|---|---|---|---|---|
| Nat. Transit | 695,594.17 | 124,750.97 | 1,051,629.65 | 555,055.73 | 593,931.04 |
| S. W. Pa. P. L. | 415,253.99 | 74,098.69 | 609,057.77 | 353,585.86 | 347,127.47 |
| Eureka P. L. | 1,207,018.46 | 283,984.98 | 274,398.56 | 270,980.17 | 239,797.34 |
| Buckeye P. L. (Macksburg) | 284,220.29 | 257,058.99 | 116,031.84 | 228,820.83 | 167,126.69 |
| Buckeye P. L. (Lima, etc.) | 2,616,930.98 | 66,302.98 | 2,371,705.54 | 1,702,435.58 | 761,115.09 |
| Buckeye P. L. (Cleveland) | 46,414.61 | 12,136.62 | 159,150.54 | 1,716.98 | 159,310.29 |
| Indiana P. L. | 561,396.24 | 2,833.35 | 1,212,545.17 | 754,554.80 | 541,771.84 |
| Cumberland P. L. | 64,408.44 | ..... | ..... | ..... | ..... |
| Southern P. L. | 183,750.86 | ..... | 90,512.33 | 70,467.39 | 66,378.80 |
| Bradford Trans. | 328,694.79 | 396,444.21 | ..... | 413,554.01 | ..... |
| N. Y. Transit | 111,520.13 | 37,877.10 | 166,394.83 | 192,298.27 | ..... |
| Northern P. L. | 328,199.83 | ..... | 491,562.77 | 151,356.84 | 310,856.76 |
| Tide Water Pipe | 941,847.74 | 23,526.84 | ..... | 424,477.09 | ..... |
| Tuscarora Dev. | 79,713.19 | ..... | ..... | 197,750.24 | ..... |
| Total November 30 | 7,864,863.72 | 1,279,014.73 | 6,542,989.00 | 5,317,052.79 | 3,967,415.32 |
| Total October 31 | 7,860,823.37 | 1,474,314.17 | 7,285,807.38 | 6,122,162.91 | 3,852,173.37 |
| Difference | 4,040.35 | 195,299.44 | 742,818.38 | 805,110.12 | 754,758.05 |

## RUSSIA CUTS INTO U. S. OIL SALES TO FINLAND

(Continued from Page 55)

bbls. went to Germany and 7,161 to the United Kingdom.

Like the other Baltic states, Latvia has few hard-surfaced roads, but is beginning to make improvements. Streets in the cities also are being improved gradually. This improvement undoubtedly will add impetus to the automobile registration, which advanced from 1,263 passenger cars, 157 buses, 550 trucks and 537 motorcycles in 1927 to 2,126 passenger cars, 340 buses, 1,469 trucks and 1,174 motorcycles in 1930.

Latest reports indicate that the price of gasoline at filling stations is $0.42 lats, or $0.08 per liter. With the enforcement of the new law of 25 per cent mixture of alcohol with gasoline, it is estimated that the price will rise to about $0.56 lats, or $0.108 a liter.

### We Lead in Lithuania

Lithuania is the least important petroleum market in the Baltics. The 1929 figures, latest official statistics available, indicate that the United States is the leading supplier of all petroleum products except kerosene. Russia appears to be gaining in the kerosene business at the expense of the United States. Economic conditions in Lithuania are bad, standards of living are low, and 85 per cent of the people are rural residents. No country roads are paved or asphalted and many city streets are of cobblestones or chipped stones.

Lithuanian imports of crude in 1928 were 58,226 bbls. with 4,473 from the United States. In 1929 they were 58,868 bbls. with 28,422 from this country. Imports of gasoline in 1928 were 32,363 bbls. with 17,961 from the United States, and in 1929 were 39,172 bbls. with 27,235 from this country.

Kerosene imports in 1928 were 128,573 bbls. with 50,871 from the United States, and in 1929 the total was 125,370 bbls. with 37,638 from this country. Lubricating oils imported totaled 18,359 bbls. in 1928 and 16,244 in 1929 with 6,126 bbls. from the United States in the former year and 6,451 in the latter.

Lithuanian imports of lubricating grease in 1929 totaled 421,079 pounds and of paraffin wax 754,414 pounds.

In 1928 Lithuania had a registration of 1,062 passenger cars, 126 buses, 219 trucks and 403 motorcycles; in 1930 records showed 1,444 passenger cars, 381 buses, 519 trucks and 235 motorcycles.

Latest price reports from Lithuania show that gasoline retailed at 0.70 lits ($0.07) per liter and had a wholesale price of 0.96 to 0.97 lits ($0.096 to $0.097) per kilo in 200-liter drums. Kerosene retailed at 0.41 lits ($0.041) per liter and the wholesale price, c.i.f. Kovno, ranged from $30 to $35 per metric ton.

### Search for Substitutes

Substitutes for petroleum products do not appear likely to affect the demand in the near future. Producer gas from wood charcoal has been tried in Finland as a fuel for automobiles, and found unsatisfactory. The extraction of fuel from wood has been attempted by scientists in Finland, but without success. Esthonia has projected a law for the compulsory mixing of alcohol with gasoline, but experts appear to consider the plan more theoretical than practical. Lithuania also has been trying to work out a plan to use alcohol for motor fuel, but its efforts still are experimental. Latvia, as mentioned, has passed a law requiring that 25 per cent of absolute alcohol be mixed with motor fuels. Practically all of these attempts have been made with the idea of using surplus native products. Almost without exception the costs of the substitutes are high, and their quality inferior to gasoline.

In Finland and the Baltic states petroleum and its products do not have the importance relative to other imports that they have in most other European countries, but statistics show that the market is growing with the increasing use of automobiles as well as labor-saving machinery for industry and the farm. As this movement progresses further the petroleum demand undoubtedly will continue to expand, but it appears likely that the intense competition among countries and companies for these markets also will continue.

## PETROLEUM MONOPOLY TALKED IN AUSTRIA

(Continued from Page 59)

guarantees in view of the impending loan negotiations.

When the details are thoroughly gone into, the view will probably prevail that there are more suitable ways of increasing the state's revenue from the consumption of mineral oil products than by the creation of a monopoly. Another point which must not be lost sight of is that petroleum companies which have invested large sums of money in Austria would by no means be prepared to acquiesce meekly in any attempt to injure them, and any effort to impair their interests would be followed by diplomatic intervention. The question is complicated by the fact that American, British, Dutch, Rumanian and Polish interests are heavily involved.

## AMERICAN UNITS MERGE FOREIGN INTERESTS

(Continued from Page 63)

stock, acquired 94 per cent control of Anglo-American Oil Co., Ltd., one of the principal marketing companies operating in the British Isles. Other important foreign marketing units of the New Jersey company are the Imperial Oil, Ltd., leading refiner and marketer in Canada, and International Petroleum Co., Ltd., prominent as a producer, refiner, and marketer in South America. In addition, subsidiary marketing companies are operated in Cuba and Brazil, and at various points in Central America. The New Jersey company's foreign marketing operations take in Canada, Mexico, the principal countries in South America, Dutch East Indies, England, and Rumania. The New Jersey company, in collaboration with Atlantic Refining Co. and Gulf Oil Corp., is now erecting a large modern refinery in France, and will have a prominent share of the French petroleum business upon completion.

Standard Oil Co. of California, while not possessing foreign marketing operations comparable in scope to those of the other three companies involved in the mergers under discussion, is nevertheless an important factor in exporting operations and has been a large shipper of refined products to many foreign countries. Its consolidation with the New Jersey company is expected to be followed by a substantial broadening of export operations in territories which can be reached more economically by tanker shipments from the Pacific Coast.

Both Standard Oil Co. (New Jersey) and Standard Oil Co. of California have important foreign producing interests, and it is probable that additional foreign refineries will be projected by this combination, as well as the Socony-Vacuum organization, as changing conditions in the world oil situation make it imperative to locate refineries closer to the larger foreign consuming centers.

### Other Mergers Possible

A number of other American companies which have previously loomed large in the export end of the business are watching with serious concern world oil developments, all of which have thus far had an unfavorable reaction on the American industry. There have been some rumors of further consolidations linking large refining and exporting interests in this country, but thus far nothing concrete has developed in this connection.

It appears probable at this time that other American companies are marking time pending new developments in the situation. There are two expected developments which might lessen the need for additional consolidations to protect foreign marketing interests—first, the possibility of an international accord for the limitation of production (such an agreement probably carrying some form of prorating of world markets for refined products) and a revival of the export association formerly operative in this country, with the policies and prices of the association to be made effective through some form of agreement with Royal Dutch-Shell or with a world organization which might logically be expected to develop in the event that Russian and Rumanian producers join with those representing the other large oil producing countries in an international compact for the regulation of the industry.

## COMPETITION CUTS U. S. SALES TO GREAT BRITAIN

(Continued from Page 63)

that political developments in Great Britain may force some action on the fuel oil question, as a protective measure for the British coal industry. A tariff, embargo, or limitation of fuel oil imports would react to the distinct advantage of American refiners. Although fuel oil products of the American industry would suffer along with oil from Rumania and Russia in the event of such a step, it is expected that American refiners would regain much of the marine business which has been lost to foreign sellers, and that the practice of bunkering for round-trp voyages at American ports would be resumed by the transatlantic lines.

### Lubricants an Exception

While the United States petroleum industry has lost ground in Great Britain this year with most major products, lubricating oils have furnished a conspicuous exception to the rule. A total of 33,534,000 gallons of American lub oils were shipped into Great Britain during the first half of the year, as contrasted with 36,294,000 gallons in the corresponding months of 1930. While the volume for the first half of 1931 registered a decline from last year, from the standpoint of gallonage, American refiners extended their "sphere of influence" in the British market, accounting for 76.1 per cent of the total trade in lubricating oils for the first half of the year, as contrasted with but 65.4 per cent of the volume handled by American lub oils in the first half of 1930.

The fact that Russian and Rumanian oil products, notably the latter, were marketed in Great Britain this year virtually as distressed prices has not helped the situation, from the standpoint of the American oil industry, as American sellers have been forced to meet this price competition to hold their British markets against this continued aggression from Russia and Rumania.

The export situation has been extremely unfavorable, from the standpoint of the American refining industry, and with foreign refining capacity steadily growing, the American trade faces a continuous fight to hold its foreign markets. Revival of the American export association, and the formulation of a world accord to govern production and distribution are seen as the final steps left to the American industry if the oil trade of the United States is to retain its former prominence in world oil markets.

## DEATH OF MARK McPEEK

Mark McPeek, aged 32 years, well known to the oil men of West Texas and Oklahoma, where he served the Parkersburg Rig & Reel Co. as field man through the boom days in Cromwell, Okla., and Winkler, Tex., died at his old home in Belpre, Ohio, December 18, after a lingering illness. After graduating from the Belpre High School, Mr. McPeek joined the force of the Parkersburg Rig & Reel Co. and following a short apprenticeship at the factory was sent to Oklahoma where he served as warehouseman and field salesman in several active oil fields.

He was later transferred to West Texas where he served as field man at Pyote, Tex., during the Winkler Pool drilling campaign and was later moved to Beeville, Tex.

## CENTRAL WEST FIELDS

(Continued from Page 47)

around 3 bbls. in No. 3 Bertha M. Smith farm, in Section or Lot 36, Jackson Township, and McCray and others' No. 1 John Milliken farm, Section 28, Cadiz Township, is showing for 5 bbls. from the Berea sand at 1,250 feet.

In Belmont County, Somerset Township, M. W. Fulton and others' No. 2 Sarah Hughes farm, Section 33, is an average gas well in the Cow Run sand at 961 feet.

In Carroll County, Turner and others' test on the John H. Scott farm, Section 30, Orange Township, proved dry in the Berea sand at 1,225 feet.

### INDIANA

One of the largest gas wells developed in Indiana for many years, was brought in by the Wabash Public Service Corp. in the northwest corner of the George B. Allen farm, NE Section 22, Columbia Township, Gibson County, with an initial gauge of 12,000,000 feet from 1,479-82 feet. In Patoka Township in the same county, the Ohio Oil Co. abandoned No. 6 Munford heirs farm, NE Section 2. In Washington Township, same company abandoned Nos. 1 and 2 Charles A. Shawhan farm, in M.D. 121; No. 1 William Hyneman farm, also in M.D. 121, and No. 1 Edith Hyneman farm, NW Section 12, same township.

Charles C. Taliaferro, Jr., struck a 5-bbl. pumper in No. 2 on his own property, in SE Section 20, Washington Township, Pike County, at a total depth of 1,163 feet. C. E. Wommer Oil Co.'s No. 3 on the Morrison Sisters farm, NE Section 30, same township, shows close to 500,000 feet of gas from 1,137-49 feet, the well being located 1,570 feet from the north line and 500 feet from the east line of the farm. A. V. Burden is drilling on the Walter Smith farm, SW Section 19, same township.

H. J. Hauck and others' test on the John Siddles farm, SW Section 4, Lincoln Township, LaPorte County, several miles south of New Carlisle, and on Mill Creek, along the highway, topped the Trenton limestone at 1,400 feet. A nice gas volume was encountered in this test at 365 feet, but the owners are after oil.

Dr. F. C. Baker and others are determined to give Craig Township, Switzerland County, a pretty thorough testing out, as they are working on four wells, No. 2 Hankins farm, Section 8; No. 1 H. M. Griffith farm, same section; No. 1 Joseph Krummel farm, Section 17, and No. 1 Ira and David Wiseman farm, Section 16.

### KENTUCKY

McLean County had an excellent oil well brought in by the Ziegler Oil & Gas Co. and George S. Engle in their No. 3 on the L. C. Atherton farm in the Barrett Hill Pool. This well had 40 feet of Barlow and Bethel sands, with heavy production from 12 feet of Jett sand. The well showed for better than 300 bbls. initial after the Barlow and Bethel sands, and will be given a shot in the Jett sand which may increase the production to a large extent, making it one of the best producers found in the county for some time. The rig has been moved to location for No. 4 on the same farm. Reports are that several other wells will start in the same area as soon as possible. This is known as the Calhoun Field.

Another spot that is attracting attention is the Niagara Field in Henderson County where Imperial Oil & Gas Products recently struck some nice oil producers.

Cox and others' No. 2 on the Charles Bell farm in the Jones Pool, Daviess County, is reported with an initial of 80 bbls. from a total depth of 880 feet. French & Hupp's No. 1 on the W. F. Ware 80 acres, in the Cane Run Pool, same county, was dry at a depth of 695 feet.

In Ohio County, Ellis & Carpenter's No. 1 Lucille Taylor farm, near Adaburg, is reported with 50 bbls. initial. Chester Oil Co.'s No. 1 on the Sam McCarty farm, in the Friendship area of the county, is said to be a 5-bbl. pumper.

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## SEES LESSENING OF COAL-OIL COMPETITION

(Continued from Page 51)

water 110. Oil is the fuel of speed; and in as much as rapidity of travel has become an essential part of modern life, it is well to remember that without the vitalizing power of petroleum fuel and lubricants the world would still have been crawling.

Let us now turn to a consideration of the petroleum industry itself, and, in particular, to an assessment of those aspects which may be regarded as problematic. The industry of petroleum may be said to have been founded in this country, and it is of interest to note that its inauguration ensued upon operations designed to extract oil from coal. In 1850, Dr. James Young patented a process for "treating bituminous coals in such manner as to obtain therefrom an oil containing paraffin." The exhaustion of the Boghead coal used by Young caused him to turn his attention to the deposits of oil-bearing shale, which existed within easy reach of his works, and, in so doing, Young founded the Scottish shale industry—which, though struggling against adversity, continues in active operation to this day.

### Unhalting Increase

The commercial production of natural crude petroleum post-dated Young's patent of 1850 by nine years. In the summer of 1859, oil was first "struck" in the United States by means of a mechanically drilled well. Twelve years, however, elapsed before the world's aggregate of petroleum production reached the figure of 1,000,000 tons. Before the war, output had risen in gradual stages to over 50,000,000 tons, since when it has progressed with increasing rapidity until world production has now attained the remarkable aggregate of approximately 200,000,000 tons a year.

It would appear from this progressive and unhalting increase that there could be nothing problematic in the production of petroleum. It must be remembered, however, that the sources from which we derive our supplies of petroleum are not constant; a field is discovered, wells are drilled, and output increases. There is, however, a limit to the amount of petroleum that can be extracted from any underground reservoir. Output from a field increases with development, reaches a peak, and then declines. This sequence of events recurs constantly, and production has attained its present level only by reason of the fact that new fields and fresh producing countries have repeatedly added their quota to counteract decline that has taken place elsewhere.

### The Immediate Future

Here then is an aspect of the petroleum industry that is both vital and problematic, and we should be right in asking ourselves with what degree of confidence the world can look forward to a continuance of its supply of petroleum, both in the immediate and the more distant future.

With regard to the immediate future, we may look with confidence to the many oil-producing areas which are now in process of operation and development. The United States is producing petroleum at the rate of over 120,000,000 tons a year, and, so great have been recent discoveries in Texas and elsewhere, that a very serious problem has been created in the control of unwanted production. Persia, Iraq, Venezuela, Russia and Rumania also possess known reserves of great potentiality, and there is little reason to doubt that the stimulus of future demand will lead to new discoveries elsewhere. The world's reserves of petroleum, so far as they are known, are scattered over many countries and are in the hands of many organizations and individuals. No collation of the data available to all those individuals and organizations has ever been attempted; and since great resources may yet remain to be discovered, all computations of the probable total of oil reserves are in the highest degree conjectural. In the past, speculation as to the volume of reserves available within the United States has frequently incited official and unofficial investigators to attempt assessment, but it is noteworthy that those estimates which have placed an indefinite limit upon the period during which oil will be available have alone remained undiscredited. All others (and there were many pessimists a few years ago) have been wholly or partially falsified in the last decade.

### Potential Productions

With respect to the world as a whole, the problem is infinitely more complex. Collation of all existing data is virtually impossible and, moreover, exploratory examination of the earth's crust is far from complete. The magnitude of the task that would be involved in such an examination is indicated by the fact that approximately half the world's land surface is comprised, at varying depths, of rocks whose geological ages fall within the range of those which, under suitable conditions, have been found to contain petroleum. (I do not, however, wish to be understood as implying that any very great proportion of these strata were deposited under conditions favorable to the formation of oil; far from it.)

In the past, the assumption has too readily been made that we were within sight of the limits of geological knowledge, both academic and applied. That belief has repeatedly been countered by the progress of science, and the postulates of but a few years back have been shown to be based upon incomplete and inaccurate premises.

In other respects, also, science has aided the petroleum industry. In the most favorable circumstances, i.e., where the oil emerges from the underground reservoir at high pressure, a considerable portion is left behind and cannot be recovered with present-day methods. The percentage of recoverable oil, which varies from field to field over a range lying within 15 per cent and 50 per cent —dependent on reservoir conditions—is being steadily increased with the progress in the science of oil recovery and there is little doubt that technical developments in the future will enable us to achieve a much higher recovery than has hitherto been possible.

### America Most Important

The United States, by virtue of its great resources, production and consumption, is the most important national factor in the oil industry. That country, alone among all nations, is at the same time, and on a large scale, a producer, consumer, importer and exporter; on the balance of these operations it exports annually some 18,000,000 tons of petroleum to foreign markets. The United States, however, although it occupies a premier position in all matters relating to petroleum, is approached with respect to exportable surplus by its South American neighbor, Venezuela, from which country petroleum is annually sent abroad in quantities amounting to about 17,000,000 tons. Persia, Russia, Mexico, Rumania and other producing countries add their quota to the stream which constantly flows from producer to consumer; and in the aggregate some 60,000,000 tons of petroleum—one-third of the world's production—are transported for use in the great centers of consumption.

The safety and reliability of any importing operation may be precarious if it is based upon the exportable surplus of, say, one or two countries. In the case of oil, however, virtually every country which produces is in a position to export a portion of its production. If, therefore, one source of supply were closed the remainder would have little difficulty in increasing their exports to compensate for the deficiency. The decline of Mexico is a case in point. Ten years ago Mexico was an important source of our oil supply. Today it has suffered a diminution both in production and in capacity to export. Nevertheless, no problem of shortage has arisen for any consuming country; and indeed, petroleum is now available in great quantities and at the lowest prices known throughout the history of the industry.

### Assured Supply

"Free" petroleum or "flow" petroleum, of which up to now I have been speaking, is the world's great front line of

supply, and I have said enough, I hope, to convince you that as regards the near future no fears need be entertained that the great mechanical and industrial structure which has been built upon oil is in any danger. The world is assured, for a respectable number of years to come, of a continuance of relatively cheap supplies, notwithstanding its high and increasing rate of consumption. We have then before us the prospect of a period —undetermined in its duration—in which supplies of "free" petroleum will be adequate to all demands. Towards the later phases of that period recourse will be had, in the natural sequence of events, to fields which, at current values, it would be uneconomic to develop. Later still, or possibly contemporaneously, oil may be won from shale or coal (of which the world's supplies are immeasurably great), but in these latter stages production costs must inevitably be higher, and industry at large must be prepared to pay a much higher bill, or alternatively must discover more effective methods of utilization.

**New Mechanical Demands**

Before we have attained the more remote distances in that vista, however, other problems will arise. The uses of petroleum are far from static or stabilized. In 20 years' time, the functions which will be required of petroleum may differ most markedly from those which it now exercises; and we may well ask ourselves whether petroleum is sufficiently versatile to adapt itself to entirely new mechanical demands. That problem may best be considered by reference to two aspects of petroleum. With one — its commercial development and utilization during the present century— we are fully acquainted. With the other —the complex nature of crude petroleum and the method by which it can best be fractionated and refined to serve a multiplicity of purposes—we now possess an extensive, if not a complete, range of knowledge.

Until the beginning of the present century, petroleum was utilized almost exclusively as a source of illuminating oil. It was found, however, that the extraction of kerosene involved also the production of at least two other substances from crude petroleum. For the lighter fraction — known today as petrol or motor spirit—there was no demand; and it was with no little difficulty that it was destroyed as a useless and dangerous by-product. At the lower end of the scale, the extraction of illuminating oil concentrated the remaining constituents of the crude in a heavy-density residue. The ingenuity of the engineer did not delay long in discovering a means for the application of that product to the service of mankind. Before the end of the nineteenth century, small vessels plying on the Caspian Sea were adapted for the use of this residual or fuel oil—as a boiler fuel. It made an early appearance in certain capital ships of the Royal Navy, initially for spraying on coal when steaming at high speeds. This was followed by the building of complete flotillas of destroyers burning oil only, and eventually light cruisers and many heavier types followed suit. The navy that emerged from the Great War was indeed to a very great extent an oil-fired navy. Of later developments at sea I have already spoken.

On the other hand, concurrently with the wider adoption of gas and electricity as illuminants, kerosene lost something of its privileged position, and outlets became restricted. Fortunately, however, the petroleum industry was enabled to achieve a more economic balance in its technical process by the approach to perfection of the internal combustion engine as applied to locomotion on land. Petrol came into its own. The dangerous waste product of early days became the elixir vitae of land locomotion.

**Detonation Problem**

Twenty years ago, the internal-combustion engines fitted to motor vehicles were slow-running, with a high ratio of weight to power. Various factors—among which may be mentioned the growing excellence of roads, the incidence of taxation, and technical developments within the automobile industry—have since combined to effect a striking change; so that, at the present time, the average motor car engine has become a lightweight, highly efficient, swift-running machine, employing for the purpose of that efficiency a very high degree of compression. In consequence of these developments, motor spirit is no longer required to possess the remarkable degree of volatility which was an essential attribute in earlier days. In place of that quality, however, many functions more difficult of attainment are needed. In particular, no spirit may claim nowadays to rank among the highest grades unless it is capable of performing its work under considerable stress of compression without betraying the slightest tendency towards "detonation." A technical description of the phenomenon of detonation would be out of place in the matter now under consideration, but you may be assured that the problems to which it gave rise were among the most difficult which the petroleum technologist has been called upon to solve.

**Diesel Engine**

The Diesel engine, to which I have already referred, differs in certain essential respects from the petrol engine. Unlike the latter, it does not require fuel prepared to a close and exacting specification. The petrol engine has a delicate appetite; the Diesel is almost omnivorous!

It is also noteworthy as having the highest thermal efficiency of any type of engine—internal-combustion or otherwise —which has yet been invented. Compared with a modern marine steam installation using coal, oil and the Diesel will give about four times the amount of effective work for the same weight of fuel.

Compared with the simple noncondensing steam engine fitted in the ordinary coal-fired rail locomotive a Diesel engine on the same weight of fuel would haul a train no less than 10 times farther.

Within the short period of 30 or 40 years, petroleum has been called upon to supply the world's requirements of fuel for use in the most rapid forms of transport on land, sea and in the air. That it has not failed to respond adequately to any of the demands which have been made on it is amply evidenced by the testimony of events. You will remember that, earlier in this review, I quoted figures regarding the increase which took place in oil-consuming units between 1920 and 1930. Motor car registrations throughout the world rose by 300 per cent, the tonnage of steamships equipped to burn fuel oil was doubled, and that of motor ships rose by 745 per cent. The mileage flown on regular air services was extended by 3,000 per cent. During the same years, the world's production of petroleum increased by little more than 100 per cent. That increase, compared with expansion that has taken place in the use of oil products, will give you an indication of the technical progress, the elimination of waste, and the conservation of natural reserves of oil that have directly resulted from the endeavors of the petroleum industry to attain perfection in all its activities.

**Wide Adaptability**

A better understanding of the bases upon which is founded the wide adaptability of oil may be attained by a brief examination of the processes which enable crude petroleum to yield the many products consumed in modern life.

The treatment of petroleum, as well as its utilization, has been the subject of a high measure of technical development during the present century. Crude petroleum was formerly refined exclusively by straight distillation—that is, the gradual application of heat with the object of evaporating and separating the lighter fractions contained within the crude. That process — much improved technically—is still the basic practice of refining; but in recent years it has been supplemented by other methods aimed at increasing the flexibility of operations and at the attainment of a measure of interchangeability among ultimate products. The process of straight distillation has this disadvantage: That from any given crude it can obtain only a defi-

(Continued on Page 118)


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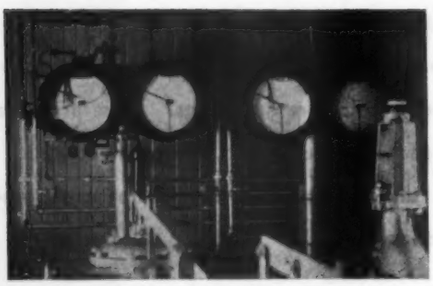

Arkansas Natural Gas Co.

Many of these instruments have been operating ever since the experimental work was completed in the early days of 1927. A few are shown on this page.

The Foxboro Differential Limit Controller automatically opens and closes a diaphragm valve in the secondary line when the load demand changes. It can handle load variations of 5,000 to 1,000,000 cubic feet per hour.

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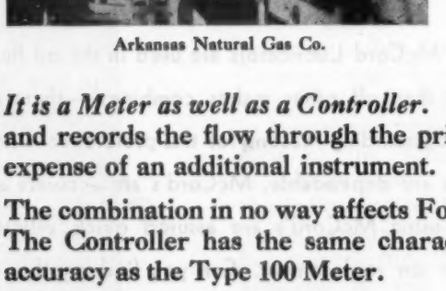

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# Natural Gas Industry Developments

## Natural Gas Industry Problems Considered By Bureau of Mines

In a recently issued annual report of the director of the U. S. Bureau of Mines to the secretary of commerce for the fiscal year ended June 30, 1931, there is a section devoted to the work done by the petroleum and natural gas division outlining the accomplishments of that division during the 12 months prior to the date of the report.

About four years ago the problem of pipe line flow of gas was undertaken by the bureau in co-operation with the natural gas department of the American Gas Association. The main objective was to determine pipe line flow formulas that would be sufficiently accurate, yet not too highly theoretical or involved to complicate their usefulness.

The conclusions, based on representative pipe line tests throughout the United States, are that the Weymouth flow formula is sufficiently accurate for purposes of design and operation, and is the most practical for all ranges of size and condition of commercial pipe lines. This study has shown further the advantages of maintaining clean pipes and the economic benefits of keeping the pressure drop at the minimum.

**Estimating Gas Reserves**

In a study of the compressibility and viscosity of natural gas, determinations of 15 representative samples show the deviation from Boyle's law, using pressures as high as 1,000 pounds per square inch. It was found that the deviation is a function of the chemical composition of the gas; gases containing higher hydrocarbons deviate more than those having a high percentage of methane.

The results obtained bear directly on estimating gas reserves by the pressure drop method, wherein it has been common practice to disregard deviations from Boyle's law. Use of this formula gives evidence that under some common conditions in natural gas fields, when the supercompressibility of the gas is neglected, the amount of calculated reserve is higher than the actual amount of gas remaining in the structure. The discrepancy lies in the fact that the amount of void space in the sand is calculated from the amount of gas that has been withdrawn and is measured at a pressure less than the reservoir pressure. The uncertainties of calculation by the pressure drop method, owing to water encroachment and to possible errors in pressure and production records, are recognized; however, if further work in the field substantiates the mathematical and laboratory results, an important contribution will have been made to the science of estimating gas reserves.

This work of controlling and gauging natural gas wells undertaken by the Bureau of Mines sometime ago is now being more generally appreciated by the gas company engineers and the use of the methods recommended by the bureau are now resulting in the following additional advantages: (1) Forecasting drilling requirements; (2) determining the presence of cavings in wells; (3) designing of gathering systems; (4) determining operating pressures; (5) estimating costs of production; and, (6) judging the advisability of storing gas in sands.

**Flow of Gas, Oil and Oil-Gas Mixtures**

After numerous tests to determine the character of flow of gas through a sand to the well it has been determined that when the quantities each of oil and water were known and were injected into the void spaces of the material, and the effect on the character of the flow observed, the tests so far show that the

(Continued on Page 85)

## LONE STAR PRESIDENT DISCUSSES GAS RATE SITUATION IN TEXAS

By L. B. Denning
President, Lone Star Gas Co.

In view of what may be termed a nation-wide demand for a reduction in all utility rates, I believe in the interest of a better understanding, it is timely to give a brief summary of the gas situation.

The demand for reduction had its inception in the feeling among users of utility service that in as much as their business and income have been affected by the general depression, utility rates should also be decreased. This demand is widespread over the country. In Texas there has been continued and general agitation for reduced rates over the entire State. At a meeting of the League of Texas Municipalities held at Fort Worth recently, it was urged that all the cities and towns in the State supplied with natural gas should adopt a uniform ordinance, without regard to what the facts were, so that the companies would be so swamped that they would be obliged to accept rate reductions and this notwithstanding that a member of the State Railroad Commission attended the meeting and pledged a speedy investigation of the cost of gas service and a proper rate therefor.

Since this meeting some 8 or 10 out of 300 communities supplied by our system, have adopted the so-called uniform rate ordinance of 50 cents. In at least one instance the city is relatively close to a portion of the gas producing field; some of the others are more than 200 miles away. A number of these cities have changed their views and have repealed their rate reduction ordinances. In our negotiations with the municipal authorities some of them frankly tell us that they do not care a rap whether or not we make any money, that they are not interested in a fair return; in some instances we have been told that if we were not losing a lot of money we were robbing the people. I cite these instances not in a critical spirit but merely to illustrate the political hysteria through which we are passing. The picture is not all black, however. In quite a few instances we have been met on a fair and equitable basis; negotiations have proceeded on the basis of reason and justice and a fair appraisal of the facts. Experience has taught me that in the end reason and justice will prevail.

**Demands on False Basis**

The demand for reduced gas rates seems to be predicated upon three main assumptions:

1. That the gas business has not been affected by the general depression and is making too much money.

2. That the price of all other commodities having come down, the price of gas should be reduced.

3. That the cost of production and transmission of natural gas has declined in line with other commodities.

None of these assumptions is true. The natural gas business has been affected by the general depression in its sales of both domestic and industrial gas. The sales of domestic gas on Lone Star System are considerably below normal for a prosperous year. To the decline in the demand for industrial gas due to the business depression there has been added a flood of cheap fuel oil which large consumers are able to buy at a price below the cost of production of natural gas.

We are told that because cotton, oil, cattle, wheat and other basic commodities have declined that the price of gas should decline also. The argument is fallacious because we are not dealing in any of the commodities enumerated. We buy but three things: Gas, labor and money. The price of gas at the well is fixed by long-term contracts which cannot be varied or changed by us without the consent of the producer. It is essential that gas purchase contracts be made for a long time in order to insure stability of supply and it is essential also that a fair and compensatory price be paid to the producer in order to encourage production; otherwise the public will suffer from a lowered standard of service and inability to obtain gas in periods of cold weather. Since there are thousands of consumers whose monthly consumption does not exceed 2,000 feet and since the average cost of gas to the domestic consumer is a little less than 15 cents per day, it will be seen that the effect on the consumer's bill of any reduction in the price of gas to the producer would be so slight as to be almost unnoticeable.

**Financial Problem**

As to money: Not only has money increased in cost but is harder to get at present than at any time during the past five or six years. During the last five years this company has needed an average of $5,000,000 new capital every year to keep pace with the growth of the communities which we serve. Our method of obtaining this is to sell stock to our stockholders. It is imperative that our credit be maintained, otherwise we cannot obtain the money for extensions and the public will suffer from restricted service. We can only maintain our credit by paying dividends to our stockholders. If we fail to earn and pay dividends, stockholders will not advance the money and we will then be compelled to borrow through the issuance of notes or bonds or again the public will suffer through restricted and poor service.

We do not have the control over our business that others do over theirs. The farmer may plant cotton or not as he chooses; he may sell or refuse to sell at current prices; if the price of cotton goes up his profit goes up along with it; he may let his land lie idle; may go away and leave it to take up some other line of business. On the other hand, if any citizen does not get all the gas he wants when he wants it he has all the power of the state at his command to compel proper performance on our part. We may not pick or choose customers; we must serve all alike. We must be ready to serve all customers with all the gas needed or desired without knowing definitely how much or when it will be desired. During all this commotion regarding reduced rates we have heard no one suggest that the standard of service should be reduced accordingly. How to maintain our standard of dependable service, meet the rising burden of taxation, maintain our credit, comply with the demands made upon us for increased facilities and at the same time reduce our rates presents an insoluble problem to us.

### LANDER GAS RATE

CASPER, Wyo., Dec. 26.—The state board of equalization, Cheyenne, Wyo., heard the protest filed by the city of Lander against the rate charged by New York Oil Co. for gas furnished in that community. The protest alleged the schedule did not provide for a discount for prompt payment of bills as provided by the franchise. The commission took the case under advisement.

### MICHIGAN HOPES FOR STATEWIDE GAS SYSTEM

MUSKEGON, Mich., Dec. 26.—The American Light & Traction Co., parent concern of the Muskegon Gas Co. and three other large municipal gas systems in Michigan, is closely watching development of natural gas production in the Mount Pleasant area with a view to possible statewide distribution. D. A. Powell, president and general manager of the Muskegon subsidiary, which distributed natural gas from the Muskegon Field for about two years, has been delegated to watch developments in the Central Michigan gas field.

A continuing record of developments is being kept by Mr. Powell so that at any time when there is considered to be enough known natural gas reserves the parent company may lay lines to several cities.

The Grand Rapids Gas Light Co., the Detroit City Gas Co. and the Washtenaw Gas Co. of Ann Arbor are subsidiaries of the American Traction & Lighting Co. of New York City.

Several smaller communities in central Michigan, including Mount Pleasant, Clare, Shepherd and others, are now served with natural gas from the Mount Pleasant Field.

### SYRACUSE GAS MIXING TO COST $1,000,000

SYRACUSE, N. Y., Dec. 28.—The changing over of the manufactured gas system to permit the use of natural gas in a mixture with artificial in Syracuse and its vicinity will cost approximately $1,000,000, it is estimated by Stefaan Piek, vice president of the Niagara Hudson Power Corp., which controls the Syracuse Lighting Co.

Mr. Piek also revealed that it is planned to extend the mixed gas service to Oswego, a distance of 38 miles, and intervening communities—Baldwinsville, Phoenix and Fulton.

### SAN DIEGO PROJECT

LOS ANGELES, Calif., Dec. 26.—San Diego Consolidated Gas & Electric Co. gets an appropriation of $890,939 for 1932 from the $25,015,936 budget of the Standard Gas & Electric Co., of which it is a subsidiary. In view of the movement to secure natural gas service at San Diego the figures have additional interest.

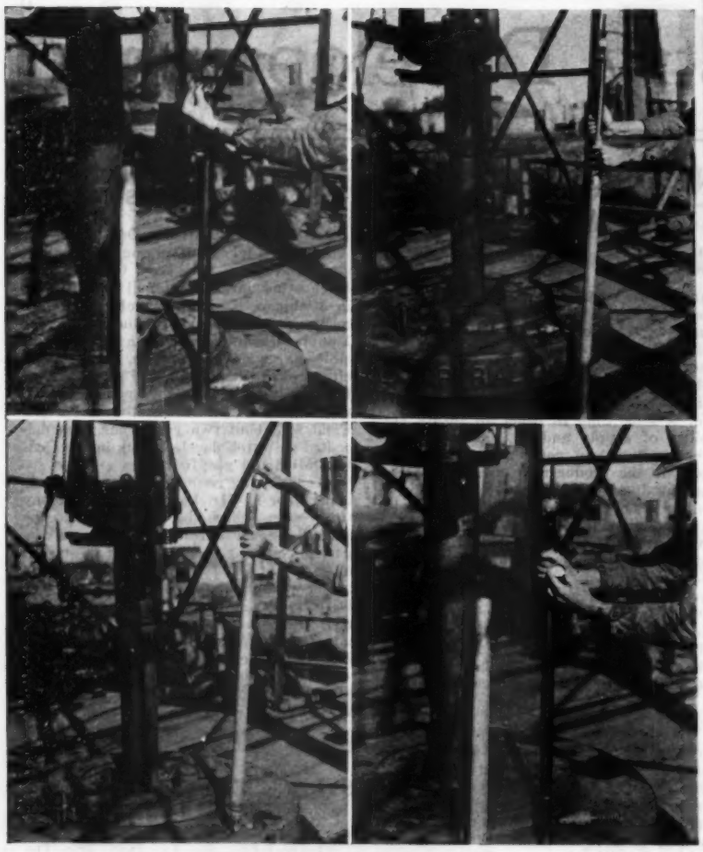
Demand for natural gas in that section has greatly stimulated interest in the possibilities of getting gas in new areas within a radius of 150 miles around San Diego. Imperial Valley, San Juan Capistrano, and several similar locations are being discussed.

### BROOKS GAS SUPPLY

CHATHAM, Ontario, Dec. 26.—Canadian Western Natural Gas, Light, Heat & Power Co. of Calgary has connected its new producing well with the local system at Brooks, Alberta, and is moving the drilling equipment to a new location where another test will be drilled. New regulator stations have been completed and put in operation.

### OHIO GAS SALE

MARION, Ohio, Dec. 28.—A $50,000 sale of the natural gas holdings of John D. Hoeffler and H. E. Schmidt in Hardin County, to the Ohio Fuel Gas Co., was authorized by the State Public Utilities Commission. The villages of Roundhead, Alger and McGuffey are supplied with gas from the holdings involved in the deal.



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## Heat Transfer Apparatus

# Personal Paragraphs About Oil Men

R. F. Garland, of Tulsa, has lately been in Gonzales County, Southwest Texas.

* * *

Lee Flowers, of the Mid-Continent Petroleum Corporation, has lately been in San Antonio, Tex.

* * *

A. C. Johnson, division manager, Linde Air Products Company, was a business visitor in Tulsa last week.

* * *

H. M. Cosgrove, secretary of the Purchasing Agents Association of Tulsa, spent the holidays with relatives in Fort Worth, Tex.

* * *

O. F. Wilcox, southwestern sales representative of the Devilbiss Paint Spray System, Toledo, Ohio, was in Tulsa on a business trip.

* * *

O. C. Staples and George Sutter of the Frick-Reid Supply Corporation, have returned to Tulsa from a business trip to East Texas.

* * *

Allan H. Hand of the Union Oil Company has acquired quite a collection of subjects as a result of his diligent study of entomology as a hobby.

* * *

Ted Larkin, formerly with the Empire Companies and the Phillips Petroleum Company as production engineer, has become sales engineer for the Happy Belting Company.

* * *

Norval (Dean) White, Pacific Coast representative of the American Petroleum Institute, is recuperating from an illness of about 10 days, following a food poisoning.

* * *

C. C. Crider, purchasing agent of the Taubman Supply Corporation, and Mrs. Crider spent the holidays on a trip by automobile to Oklahoma City, Houston and Galveston.

* * *

Russian engineers were in Toledo, Ohio, recently inspecting the East side oil refineries. Members of the party included S. Soumenkoff, manager of the Konstantin refinery, Yarvslovij, U.S.S.R., and P. Spiridonoff, manager, Varin refinery, Sormovo, U.S.S.R.

* * *

C. C. Roberts, engineer for United Production Company at Beeville, Tex., is resigning the first of the year and will take up his new duties as engineer in charge of field operations in the San Antonio district for Laughlin-Simmons & Company with headquarters in San Antonio. Mr. Roberts has had many years' experience in this district. L. C. Forbis, formerly of the Superior Oil Company, has been stationed for some time in Gilmer, Tex., as engineer for Laughlin-Simmons & Company.

* * *

George W. Colvell, drilling superinendent of the Anglo-Persian Oil Company, who has been visiting various fields in the United States to study latest drilling methods and inspect new equipment, is making a tour of the California fields at the present time. Mr. Colvell, who arrived in New York November 11, and has already visited East Texas, Gulf Coast and the Mid-Continent area, will return to Persia via New York and England immediately upon completion of his inspection tour of California fields.

* * *

Some 50 employes of the Eureka Pipe Line Company assembled in Mannington, W. Va., to honor Thomas A. Leonard, veteran district superintendent of the company, who retires the first of the year after 43 years of active service. During the dinner a handsome Gladstone bag was presented Mr. Leonard in token of the high respect and affection of his fellow employes. Mr. Leonard, a native of New York State, has been connected with every branch of the pipe line business, and has made his home for 40 years in Mannington, W. Va., where he will continue to reside. E. W. Macklin, general superintendent, with offices in Parkersburg, W. Va., presided at the dinner.

Vernon L. King, independent operator, has been in San Antonio, Tex., looking over the country.

* * *

Cecil Hagen, geologist, formerly with the Yount Lee interests, has opened offices in San Antonio, Tex.

* * *

T. W. Hamilton is back in the United States and staying with friends in San Antonio, Tex., after an absence since 1923 in Venezuela.

* * *

W. E. Clark, independent operator of North Central and Southwest Texas, has moved his residence temporarily from San Antonio to McAllen, Tex.

* * *

John O. Gibson, of San Antonio, Tex., is recovering from an operation for appendicitis. He was formerly with the Lion Oil Refining Company and other major concerns.

* * *

R. S. McFarland, who is associated in a consulting capacity with the Seaboard Oil Company of New York, has returned to Tulsa from a business trip to New York and is making a survey of conditions in the Mid-Continent area.

## Men of the Industry

**D. W. Harris**

D. W. Harris, vice president and general manager of the Arkansas Natural Gas Corporation, was born in Macon, Ga., and is a son of a former governor of that State. Graduated at the Georgia School of Technology, Mr. Harris joined the engineering training school of the Doherty organization in Denver, Colo. After a year in the training school, he was transferred to the general offices of the company in New York. He served 10 years with the organization there, advancing to director of the budget and assistant treasurer of the Cities Service Company.

In 1923 Mr. Harris went to Bartlesville, Okla., as treasurer of the Empire Gas & Fuel Company, one of the main subsidiaries of the Cities Service Company. Later he became vice president of the Indian Territory Illuminating Oil Company.

Not only was he one of the outstanding business men of Bartlesville during his five years' connection with the Empire company, but he also played a prominent part in civic affairs. He was president of the Bartlesville Chamber of Commerce, active in the Rotary Club, and a director of the First National Bank there. Mr. Harris is a director of the Shreveport Y. M. C. A., and of the Shreveport Chamber of Commerce. He also is a member of the executive council of the Boy Scouts of Shreveport and a member of the Rotary Club and the Shreveport Country Club.

J. S. Freeman, assistant to the vice president of production of Skelly Oil Company, is reported ill.

* * *

F. H. Etheridge, of the Rio Grande Oil Company of California, is now living in San Antonio, Tex.

* * *

C. H. Henninger, superintendent in the Healdton area for the Magnolia Pipe Line Company, is reported ill at an Ardmore hospital.

* * *

George Horton of Chicago, president of Chicago Bridge & Iron Works, Incorporated, spent a day in Tulsa en route home from East Texas.

* * *

Jerry Monaghan of the Mid-Continent Petroleum Corporation of Tulsa was married Christmas day to Miss Isabell Kerrigan of Toronto, Canada.

* * *

Robert G. Stewart of New York, president of Pan American Petroleum & Transport Corporation, has returned from a business trip to Europe.

* * *

M. H. Kotzebue, vice president of the Tulsa Boiler & Machinery Company, with Mrs. Kotzebue has returned from a honeymoon spent in San Antonio and South Texas points. He was married on December 5 to Miss Mildred Swain of Tulsa.

* * *

L. R. Varcoe of the Empire Companies was made president of the Bartlesville Rifle and Pistol Club. W. B. Farley, Phillips Petroleum Company, is vice president, and John Leisure, Empire Companies, secretary-treasurer; L. W. Lemert, Bart Products Company, statistical officer, and S. L. Hereford, Empire Companies, range officer.

* * *

In celebration of his thirty-seventh year in the service of the Ohio Oil Company, friends of Fred L. Wing of Gibsonburg, Ohio, staged a party in his honor in a large assembly hall in Gibsonburg recently and in the course of the evening presented a fine traveling bag to him while Mrs. Wing received a beautiful bouquet of flowers. It was one of the largest private parties ever given in Gibsonburg and guests were present from every oil town in the Lima Field.

* * *

With the dissolution of the Texas Production Company and its substitution by the Rocky Mountain division of The Texas Company of Delaware producing department, the following personnel has been announced: A. R. Wilson, division manager, Denver; L. J. Daly, division superintendent, Denver; J. C. Hudnall, chief clerk, Denver; Hugh A. Stewart, geologist, lands and leases, Denver; W. W. Moore, petroleum engineer, Denver; B. A. Lagarde, chief warehouseman, Denver; C. F. Nicklos, district superintendent, Colorado district, Hamilton; and K. D. Pardee, district superintendent of the Wyoming-Montana district, Billings.

* * *

R. E. Donovan, Standard Oil Company of California, San Francisco, has been appointed chairman of the committee on accident prevention in production, a unit of the American Petroleum Institute's division of production. H. N. Blakeslee, American Petroleum Institute, Dallas, Tex., is secretary. Other members are: C. P. Anderson, Richfield Oil Company of California, Los Angeles; H. W. Boggess, Sinclair Oil & Gas Company, Tulsa; H. E. Dischinger, Shell Petroleum Corporation, St. Louis; John Hammerman, Jr., Gulf Production Company, Houston; C. L. Hightower, Texas Pacific Coal & Oil Company, Thurber, Tex.; L. R. Hodell, Carter Oil Company, Tulsa; H. W. Jackson, Kendall Refining Company, Bradford, Pa.; J. L. Manes, Sun Oil Company, Dallas; George F. Prussing, Union Oil Company of California, Los Angeles; R. B. Roaper, Humble Oil & Refining Company, Houston; T. N. Shaw, Midwest Refining Company, Casper, Wyo.; C. W. Smith, Standard Oil Company of Indiana, Chicago; J. P. Sutton, Ohio Oil Company, Findlay, Ohio, and D. J. Wallace, Mid-Continent Petroleum Safety Council, Tulsa.

# Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

*In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.*

*Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.*

*In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.*

*In case an immediate answer is important, one will be given by mail if the writer requests it.*

## FORMULA FOR TANK CAPACITY

**Can you give me a simple formula (or constant) for figuring the capacity of upright cylindrical tanks? Would prefer the constant carried out to several decimals, if possible, as I wish to figure the tank tables very accurately. Something like the following is what I need:**

**$C^2$ (in feet) multiplied by some constant equals barrels per inch.**

**Has the A.P.I. put out any bulletin or booklet with formulas of this kind? I just got the A.P.I. code No. 25, which gives information about sampling and testing crudes, but nothing about converting tank strapping into tank tables.**

**Would also like to know some simple figure to subtract for each sixty-fourth of an inch of tank stave thickness. Bacon & Hamer give a deduction of .033 (or .0326) per foot for every one-sixteenth thickness of tank stave. Any general information along this line would be greatly appreciated.—A. B.**

1. To determine the capacity of tanks of circular cross section and constant diameter in terms of barrels of 42 gallons as used in the oil business or in terms of gallons the following constants may be used:

Let V equal volume of cylinder in barrels of 42 gallons,
D equal diameter in feet,
C equal circumference in feet,
H equal height or length of cylinder in feet.

Then V equals 0.1398853872 $D^2$ H,
Also V equals 0.014173353 $C^2$ H,
If Q equals capacity in barrels per inch of height,
Then Q equals 0.00118111275 $C^2$.
Let G equal volume in U. S. gallons,
Then G equals 5.875186262 $D^2$H,
And G equals 0.595280826 $C^2$H.
The above figures were compiled by E. H. Wilcox and R. V. Buckner of Los Angeles, Calif.

2. This department does not know of any A.P.I. bulletin that gives formulas of this character. If you will write Carl A. Young, 1508 Kirby Building, Dallas, Tex., he can inform you if the institute has adopted any formula as standard for A.P.I. tank specifications.

3. To determine inside capacity of a tank when outside measurements are known: Subtract .00818123 for each one-sixty-fourth inch of thickness of stave from the circumference of the tank expressed in inches. A table for this deduction can be determined for all thicknesses of staves by multiplying the above factor by each sixty-fourth of an inch; for instance, for one-half inch multiply by 32, and by any other number of sixty-fourth of an inch for other thicknesses.

## PUMPING WELL IN MUDDY SAND

**Our immed'ate problem is pumping a small well in muddy sand, with a gas pressure that builds up to quite a pressure in heads. I am taking the liberty of asking you to suggest some good book or books on practical pumping of oil wells. This is the sort of problem on which I would like to read up.—E. J. R.**

A paper by R. R. Hawkins in the October 8, 1931, issue of The Oil and Gas Journal on "Tubing Small Flowing Wells" should be of interest to you. There are many other articles in The Oil and Gas Journal touching on your problem and you will find these conveniently indexed in the semiannual number. By writing to the U. S. Bureau of M'nes, Washington, D. C., you can obtain a list of publications discussing production problems, and some of these may be of value to you. The American Petroleum Institute publishes numerous papers presented before the various meetings held in different parts of the country. These deal largely with production problems and they are available to members of the institute.

Two books of special value to oil production men are "Deep Well Drilling," by Walter H. Jeffery, Second National Bank Building, Toledo, Ohio, and "Oil Well Completion and Operation," by Prof. H. C. George, University of Oklahoma, Norman, Okla. The former book costs $6 and the latter $6.

## WOULD A SEPARATOR HELP?

**Kindly advise as to whether a gas separator would be of any benefit in a gas well 81 feet deep, 12 pounds pressure, with 36 feet of water.—H. A. P.**

The purpose of your question is not entirely clear, but it is probable you would be interested in an article printed in the January 23, 1930, issue of The Oil and Gas Journal, page 34, entitled "Removing Moisture From Gas Lines." This article describes an automatic drip that will remove moisture from gas lines either at the well head or along the right of way where needed. It has been developed by experienced gas engineers and has proved satisfactory where used.

You might also be interested in Technical Paper 460 prepared for the U. S. Bureau of M'nes by I. B. Williams, R. R. Brandenthaler and Morgan Walker, which deals with "Design and Operation of Gas-Well Siphons." Drips are described in that paper, also as well as the design of lines into the well that will produce the water along with the gas. A copy of this paper can be obtained by sending 10 cents to the Superintendent of Documents, Washington, D. C. Do not send stamps.

## BATCHES OF OIL IN LINE

**I have heard the term "batched oil" used in connection with pipe line delivery of crude oil and will appreciate it if you can give me an explanation of this process.—D. M. E.**

A pipe line system may be likened to a drainage system on the surface of the land where the water starts from springs, and gathers successively into brooklets, creeks, small rivers and finally into the stream that drains vast areas and carries the waters to the sea. With the pipe line system the oil originates at the well and is put into lease storage tanks. From these tanks it goes into the pipe line company's gathering lines and is collected in the work tanks of the pipe line system and then delivered through this system to refineries or storage terminals, sometimes close to the source and sometimes at far-distant points.

### WHY WAS IT CALLED THAT?

#### SOUP

Two explanations are seen for the use of the word "soup" to designate nitroglycerin employed in oil well shooting. One is that both the appearance and the liquid quality of the explosive are faintly suggestive of the familiar dinner course which follows the fruit cocktail. The other is the jocose habit of applying to highly dangerous substances names which signify utter harmlessness. "Blasting oil" and "pep fluid" are other terms sometimes used in referring to nitroglycerin.

It is obvious that when oil from hundreds of wells is being handled through one pipe line system it will be mixed and under such conditions it is usually referred to as "common stream mixture." This mixture is checked and sampled at various points along the line and accurate accounting is given.

If, however, it is necessary to deliver to a customer, say an eastern refinery, a certain number of barrels of oil of a particular grade that must be handled through the pipe line system this particular lot of oil is known as a "batch."

To accomplish this delivery one of several methods may be followed, but as the rate of flow through the pipe lines is accurately gauged it is possible to select a time at which this batch of oil is to start its movement through the trunk line system and by keeping track of the rate of input and the time elapsing the entire tank or more oil can be delivered at the terminal practically in the same condition as it was at the field end of the system.

The time calculation is made on distance, and the receiving station will arrange to switch this oil into separate tankage as it begins to arrive at the discharge end. As the oil has been taken originally from one or more tanks at the input end of the line and none introduced along the route this method of handling gives satisfactory results and the actual amount of mixed oil at each end of the batch is small.

When a batch is expected it is customary to take samples from the line at increasingly short intervals so that when the analysis definitely shows the oil that is to be handled as a batch is arriving the valves can be closed and the oil diverted into the tanks set aside to receive this batch shipment.

This procedure may be repeated several successive times through different sections of the pipe line system until the batched oil arrives at its distant destination. Other methods that are used to accomplish this same purpose are usually some modification of the one described above.

The process of transporting different kinds of products through the same pipe line is referred to also as "slugging," and the various products themselves are referred to as "slugs."

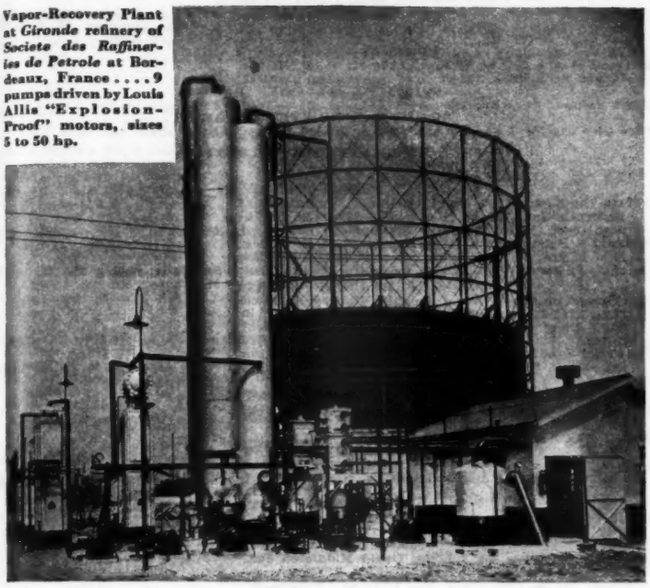
## FISHES AS SOURCE OF OIL

**There appeared in The O'l and Gas Journal an article about fish being the source of oil. I want to ask if it seems reasonable that there ever were enough fish in any body of water to produce the enormous quantities of petroleum that are taken from underneath the ground. I do not think I ever have seen this fish theory referred to since. Do geologists generally accept this theory or do any great number of them accept it?—D. L. E.**

The theory to which you refer was offered about 10 years ago by Dr. John Muirhead Macfarlane, a scientist of high standing, in his book "Fishes the Source of Petroleum," which stirred much controversy. It would be futile to hazard any guess as to how many geologists accept Doctor Macfarlane's theory just as he has propounded it, but it may be stated as a probable fact that most geologists today assign the origin of petroleum to neither plant remains nor animal remains exclusively, but regard both these sources as probably having contributed to oil deposits. This admits fishes as having been a factor without attempting to say how important a factor they may have been.

Doctor Macfarlane recently produced another work, "The Quantity and Sources of Our Petroleum Supplies," in which he deals further with the occurrence and distribution of petroleum, with particular regard to the North American continent and in which he reaffirms his theory concerning fishes as the source of crude oil deposits. Most of the book deals with "the three most rich and important deposits of oil rock over that extensive land mass," the Mowry shales of the Middle West, the Green River shales of Wyoming, Utah and Colorado, and the Miocene shales of Southern California. These, he points out, "form a group of distinct but in some respects superposed beds of remarkable type and of unique richness in petroleum." The author traces the events which, he asserts, resulted in the origin and formation of petroleum deposits in these rocks, which process he associates with the existence of certain types of primitive fishes.

The point you raise as to the likelihood of there having been enough fishes in any body of water to produce the oil now found is touched on in a chapter in which Doctor Macfarlane says that in the evolution of the groups of shales which he describes, a definite sequence of events was constantly associated with seismic and volcanic phenomena. An almost invariable accompaniment of volcanic activity is widespread destruction of life, more accentuated over water than over land areas. Details of recent great upheavals show that destruction of aquatic life through them is sudden, severe and wholesale. Of all the organisms involved, fishes stand out as pre-eminent and most sensitive sufferers, and they "often move in such serried or crowded shoals that a water depth of 20 to 100 feet may be almost solidly occupied by them for many miles, as in the recorded cases from the three formations cited, and in such recent examples of fish migration as those described for the menhaden, herring and numerous others."



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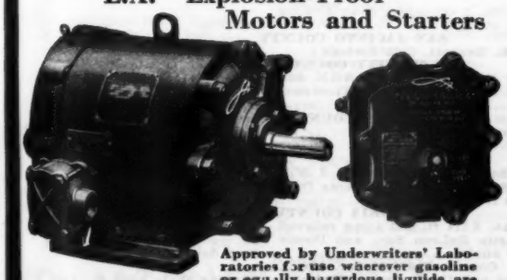

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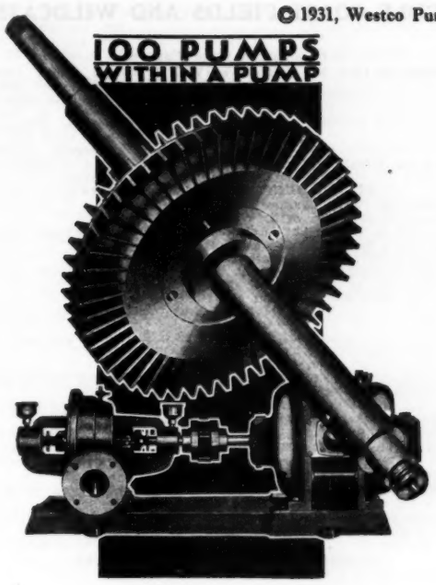


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## WESTCO *TURBINE* PUMPS

SINGLE STAGE—HIGH PRESSURE

# GULF COAST FIELDS AND WILDCATS

(Continued from Page 40)

Daisetta and Liberty Oil Co.'s No. 1 Bashara (W.O.).... Total depth 4,408 ft. in black shale; set 264 ft. of 4½-in. screen in sand at 4,172 ft. with 236 ft. of 3-in. drill stem to bottom; swabbed in blowing dry gas, mud and water, 240 lbs. pressure; to reset.

Weneedan Oil Co.'s No. 2 Palmer, Chas. Underton Sur. .. Failed to pump 2,225 ft.; pulling tubing.

**PIERCE JUNCTION—HARRIS COUNTY**

Gulf Prod. Co.'s No. 34 Taylor, James Hamilton Sur. No. 52, 141 ft. S of NW cor. of J. W. Howe 190-acre tract and 430 ft. W at right angles ..... Drlg. gumbo 2,805 ft.

Humble Oil & Ref. Co.'s No. 1 Hooks, James Hamilton Sur. No. 52, 904 ft. N of SW cor. along W line of lease and 396 ft. E at right angles ..... Drlg. gumbo 1,270 ft.

Rio Bravo Oil Co.'s No. 10-A Settegast (W.O.), Jos. Kopman Sur. No. 44, 1,300 ft. S and 350 ft. W of NE cor. of lease ..... Cem. hole to 2,680 ft.; to sidetrack.

Isaacs & Carwile's No. 1 Settegast (W.O.) ..... Gumbo and lime 3,208 ft.; fishing.

Navarro Oil Co.-Texas Exp. Co.'s No. 16 Dooley (W.O.), J. Hamilton Sur., 50 ft. from W line and 487 ft. from S line tract ..... Pulling screen to deepen 4,665 ft.

Rio Bravo Oil Co.'s No. 18-A Settegast, J. Kopman Sur. (W.O.) ..... Drlg. hard sandy shale 5,337 ft.

Rio Bravo Oil Co.'s No. 23-A Settegast, Jos. Kopman Sur. No. 44, 1,375 ft. S and 300 ft. W of NE cor "A" lease ..... Derrick.

**HIGH ISLAND—GALVESTON COUNTY**

Yount Lee Oil Co.'s No. 20 Cade, N. Fitzsimmons Sur., 161 ft. W of No. 15 and 146 ft. SW of No. 17 ..... Shut down 60 ft.

Yount Lee Oil Co.'s No. 24 Cade, 1,010 ft. from NE line and 1,350 ft. from NW line of N. Fitzsimmons Sur. .. Drlg. sandy lime 4,420 ft.

Yount Lee Oil Co.'s No. 25 Cade, N. Fitzsimmons Sur., 100 ft. due W of No. 23 ..... Drlg. hard sandy lime 3,660 ft.

**DAMON MOUND—BRAZORIA COUNTY**

Intercoastal Oil Co.'s No. 6 Wisdom (D.D.), A. Darst Sur., Blk. 51, 2,550 ft. from NE line and 1,150 ft. from NW line of 340-acre tract ..... Lime and rock 3,480 ft.; drill stem stuck; trying to sidetrack.

The Texas Company's No. 1 Cave heirs, 75 ft. SW, 150 ft. SE at right angles from N cor. of Lot A, Blk. 73, Wisdom Subd., A. Darst League ..... Drlg. hard sand and lime 3,274 ft.

**ORCHARD—FORT BEND COUNTY**

Gulf Prod. Co.'s No. 31 Moore, 3,816 ft. S and 3,432 ft. W of NW cor. of James Frazier Sur. in Mark Smith Sur. ..... Drlg. sticky shale 3,486 ft.

**THOMPSON—FORT BEND COUNTY**

Cullen & West and Gulf Prod. Co.'s No. 2 George (W.O.), J. Rabb Sur. ..... Set screen 5,201 ft.

Cullen & West and Gulf Prod. Co.'s No. 1-A Lockwood & Sharp (D.D.), John Rabb Sur. ..... Total depth 4,807 ft.; blew out around 4,500 ft.; derrick and rig destroyed; standing.

Cullen & West and Gulf Prod. Co.'s No. 4-A Lockwood & Sharp, J. Rabb Sur., 550 ft. W of No. 2-A ..... Derrick.

Cullen & West and Gulf Prod. Co.'s No. 1 J. H. P. Davis, Robert Peebles Sur., 350 ft. S and 900 ft. E of SW cor. of A. P. George 619-acre tract ..... Cored oil sand 5,275-86 ft.; cem. 6⅝-in. casing 5,284 ft.; drilled plug and comp. flowing est. 3,000 bbls. daily.

Gulf Prod. Co.'s No. 1 Mary D. Booth Meyers, J. Rabb Sur., 800 ft. N of Cullen & West's No. 2-A Lockwood & Sharp ..... Sand showing oil 5,059-74 ft.; cem. 7-in. casing 5,050 ft.

Gulf Prod. Co.'s No. 2 Mary D. Booth Meyers, J. Rabb Sur., 600 ft. E of No. 1 in center of tract ..... Location.

**NASH—BRAZORIA COUNTY**

Harrison & Abercrombie's No. 15 Nash (D.D.), Thos. Aisbury League ..... Shale 6,035 ft.; fishing drill stem.

**SARATOGA—HARDIN COUNTY**

Rio Bravo Oil Co.'s No. 124-A Cotton ..... Comp. pumping 50 bbls. pipe line oil 518 ft.

**MARKHAM—MATAGORDA COUNTY**

Deering & Newman's No. 1 Hawks (W.O.), W. H. Gayner Sur., 200 ft. from S line and 100 ft. from E line of tract ..... T.D. 4,150 ft; set whipstock to sidetrack 3,900 ft.

**LOST LAKE—CHAMBERS COUNTY**

Pure Oil Co.'s No. 6 Lost Lake, 2,381 ft. W and 289 ft. S of No. 5 in Lost Lake ..... Drlg. anhydrite 6,185 ft.; top of anhydrite 6,169 ft.

Pure Oil Co.'s No. 14 Mayes, E. H. R. Wallis Sur., 650 ft. due E of No. 11 in line with No. 9 ..... Derrick.

**MOSS BLUFF—LIBERTY AND CHAMBERS COUNTIES**

Gulf Prod. Co.'s No. 4 McFaddin, J. McFaddin Sur..... Drlg. sticky shale 6,925 ft.

Manning Trust Co.'s No. 2 Sergent, Jas. McFaddin Sur. .. Drlg. gumbo 205 ft.

**REFUGIO—REFUGIO COUNTY**

Larco Gas Co.'s No. 4 Strauch heirs, 150 ft. from N line and 150 ft. from W line, Lot 6, Blk. 2 ..... Topped sand showing oil 3,686 ft. cmtd. 6⅝-in. csg.

Moody Seagraves Prod. Co.'s No. 2-A St. John, Refugio town tract, 600 ft. E of No. 1-A and 300 ft. from N line of lease ..... Sand 5,504-18 ft.; reset 15-ft. screen.

United Prod. Corp.'s No. 2-A W. J. Fox, Wm. Hews and L. Brown Sur., 2,099 ft. NE along SE line from SE cor. of lease, thence 1,690 ft. NW at right angles .. Coring sand 6,420 ft.

**SOUTH LOUISIANA YIELDS**

**LOCKPORT—CALCASIEU PARISH**

Vacuum Oil Co.'s No. 8 Farquahar (W.O.), Sec. 9-10s-9w.. Drlg. shale 5,573 ft.

Vacuum Oil Co.'s No. 32 Miller, 925 ft. E and 480 ft. S of NW cor. S half of NW of Sec. 9-10s-9w ..... Oil sand 4,373 ft.; cem. 9⅝-in. casing 4,350 ft.

**JENNINGS—ACADIA PARISH**

Yount Lee Oil Co.'s No. 10 Housierre-Latrielle, 5,435 ft. E and 1,970 ft. N of SW cor., Sec. 47-9s-2w ..... No report; previous report drlg. sand and shale 3,002 ft.

**HACKBERRY—CAMERON PARISH**

Calcasieu Oil Co.'s No. 28 Watkins (W.O.), 2,495 ft. W and 132 ft. N of SE cor. Sec. 13-12s-10w ..... Rig up to deepen 2,844 ft.

Calcasieu Oil Co.'s No. 30 Watkins, 1,236 ft. W and 1206 ft. N of SE cor. of Sec. 13-12s-10w ..... Set screen 3,022 ft.; comp. flowing 4,500 bbls. pipe line oil daily.

Calcasieu Oil Co.'s No. 31 Watkins, 1,402 ft. W and 1,120 ft. N of SE cor. of Sec. 13-12s-10w ..... Drlg. gumbo 250 ft.

R. E. Seiss' No. 3 Vincent, 2,195 ft. S and 1,320 ft. W of NE cor. Sec. 36-12s-10w ..... Location.

R. E. Seiss' No. 2 J. M. Vincent ..... Shut down 2,163 ft.

J. G. Sutton's No. 4 Irwin, 1,520 ft. N and 1,195 ft. W of SE cor. Sec. 13-12s-10w ..... Set screen 3,008 ft.; comp. flowing 2,000 bbls. pipe line oil daily.

Yount Lee Oil Co.'s No. 44 State, 1,110 ft. N and 1,915 ft. W of SE cor. Sec. 13-12s-10w ..... Location.

Yount Lee Oil Co.'s No. 45 State, 1,230 ft. N and 810 ft. W of SE cor. Sec. 13-12s-10w ..... Location.

Yount Lee Oil Co.'s No. 48 State, 1,290 ft. N and 1,320 ft. W of SE cor. of Sec. 13-12s-10w ..... Drlg. gumbo 500 ft.

**VINTON—CALCASIEU PARISH**

Marrs McLean's No. 9 Gray (D.D.) ..... Coring sand 2,872 ft.

Vinton Pet. Co.'s No. 1 Matilda Gray (D.D.), 48 ft. N and 89 ft. W, SE cor. SW NE, Sec. 33-10s-12w.... Set 20 ft. of 3-in. screen 3,214 ft.; comp. pumping 10 bbls. pipe line oil daily.

**EDGERLY—CALCASIEU PARISH**

Emerson et al's No. 14 Hunter, 1,100 ft. N of NE cor. Bright Penn lease, 850 ft. E of No. 10, Sec. 21-9s-11w. Coring sand 3,800 ft.

**SULPHUR—CALCASIEU PARISH**

Union Sulphur Co.'s No. 722 fee (W.O.), Sec. 29-9s-10w .. Drlg. gumbo and lime 4,065 ft.

**SWEET LAKE—CAMERON PARISH**

Pure Oil Co.'s No. 5 Sweet Lake (D.D.), Sec. 12-12s-8w .. Drlg. shale and lime 6,860 ft.

**MISCELLANEOUS WILDCATS**

**TEXAS**

**AUSTIN COUNTY**

O'Hara Oil & Gas Co.'s No. 1 Nellous, J. C. Cummings Hacienda Sur., 650 ft. N of No. 1 Schroeder in 18-acre tract, north edge Mill Creek ..... Derrick.

Pomacal & Boletka's No. 1 Schebajsa, 329 ft. N, 78 deg. E of N. cor. B. Dottery Sur., near center of SW line of S. F. Austin 4 League on west fork of Mill Creek.. Set 10-in. casing 120 ft.

**BRAZORIA COUNTY**

The Texas Company's No. 2 Belcher, Harvey N. Little Sur., 1,728 ft. southeasterly from N cor. of S half of Sur., along NE line and thence 123 ft. at right angles ..... Drlg. rock 2,202 ft.

United Oil Syndicate's No. 1 Levitt, 900 ft. from W line and 400 ft. from S line of John Peske Sur. ..... Total depth 1,594 ft. in gumbo; drill stem stuck.

**BURLESON COUNTY**

Marek & Son's No. 3 A. Marek, N. McFaddin Sur., 1,068 ft. N and 225 ft. W of SE cor. of tract ..... Standing 2,210 ft.

M. O. & T. Corp.'s No. 1 Rigers ..... No report.

**FORT BEND COUNTY**

Stone & Wyman's No. 1 Beard, H.&T.C. Sur. No. 118, 1,150 ft. from NW line and 1,892 ft. from NE line ... Shut down 1,275 ft.; 2 joints drill stem lost in hole.

**GRIMES COUNTY**

Rianjo Oil Co.'s No. 2 Cuthrell, Pat B. O'Connor Sur., C of 110-acre tract ..... Fishing 3,534 ft.

**HARRIS COUNTY**

Givens & Daybault's No. 1 Lobit, David Middleton Sur., Blk. 19, Lobit Subd. ..... Drlg. sticky shale 2,720 ft.

Louisiana Oil & Dev. Co.'s No. 1 J. W. Wilson, W. Ritchie Sur. ..... Shut down 420 ft.

Shubert & Alexander's No. 1 Herman Hale, 1,058 varas E of NW cor. R. A. Hanks Sur., thence 790 varas S and thence 70 varas W 74 deg. ..... S.D. for fuel 2,620 ft.

**JASPER COUNTY**

Hext Drlg. Co.'s No. 1 Flourney, B. F. Jones Sur., 600 ft. NW of Helmerich & Payne's No. 1 Flourney .... Shut down 2,814 ft.

**JEFFERSON COUNTY**

Brown et al's No. 1 M. O. Todd, 200 varas S and 58 varas E of NW cor. of Wm. Carr Sur. ..... Derrick.

John I. Pipkin and Elam's No. 1 Broussard, McGaffey Sur., 800 ft. from S line in center E and W of 205-acre tract ..... Shut down 904 ft.

Texas Gulf Sulphur Co.'s No. 1 Junker, W. H. Smith League, 100 ft. S and 1,000 ft. W of NE cor. of tract.. Sulphur test.

Texas Gulf Sulphur Co.'s No. 1 Thomas Fannett, Wm. Smith Sur., 1,950 ft. W, 1,000 ft. S of NE cor. of Thomas' 446-acre tract ..... Sulphur test.

Westbury Oil Co.'s No. 4 West, 450 ft. W and 4,210 ft. S of NE cor. of T. D. Yoakum Sur. ..... Shut down in gumbo 600 ft.

**LIBERTY COUNTY**

Hamm et al's No. 1 Harvard, Davis Hill ..... Gumbo 1,015 ft.; shut down.

**MATAGORDA COUNTY**

United North & South Oil Co.'s No. 1 Stoddard, J. C. Keller Sur., 150 ft. W and 545 ft. N of SE cor. Blk. 53, Buckeye townsite ..... Drlg. sandy shale 5,887 ft.

Harvey Smith's No. 1 Baker (Citrus Grove), J. V. Criswell Sur., Robbins Subd., 2,000 ft. S and 2,000 ft. E of NW cor. of Lot 14 and Lot 15 ..... Drlg. sandy shale and lime 5,663 ft.

**MONTGOMERY COUNTY**

Pevehouse Oil Co.'s No. 1 Sealey, Jas. Pevehouse Sur., 1,575 ft. N of N line of Horton & Woodson's 1,562-acre tract and 2,226 ft. E of W line of H.&W. 1,870-acre tract ..... Drlg. gummy shale 2,264 ft.

**NEWTON COUNTY**

R. T. Briscoe et al's No. 1 Joe Inman, approx. 1,900 ft. E and 500 ft. N of SW cor. of J. M. Scott Sur. ..... Fishing drill stem 1,300 ft.

**ORANGE COUNTY**

Altex Oil Co.'s (Veteran Oil Co.) No. 1 Reed, A. Nelson Sur. No. 1, 500 ft. from N line and 250 ft. from E line of tract ..... Total depth 4,063 ft.; sidetracked 1,200-2,200 ft.; shut down

Crew Oil Co.'s No. 1-A Mansfield, 50 ft. E of No. 1 ..... Total depth 2,060 ft.; reaming to bottom.

**POLK COUNTY**

Freeman et al's No. 2 Freeman ..... Shut down 3,162 ft.

T. B. Hoffer's No. 1 Saner-Ragly Lbr. Co., 300 ft. out of most northerly cor. of most easterly County School Land Abst. 271 ..... Shut down 1,517 ft.

Trans-Coastal Oil Co.'s No. 1 M. E. Roberts, J. F. Rumayor Sur., 350 ft. from W line and 150 ft. from N line of tract ..... Abandoned 750 ft.

**REFUGIO COUNTY**

Blanco Creek Oil Co.'s No. 1 Damaan, 150 ft. from N line and 150 ft. from W line of Blk. 14, Bonnie View Ranch Subd. ..... Shut down 4,927 ft.

J. C. Dixon's No. 1 Peck, 450 ft. S, 150 ft. E of NW cor. of S half of Sec. 24, Bonnie View Ranch Subd., Estaban Lopez Sur. ..... Cmtd. 12½-in. csg. 100 ft; standing.

Humble Oil & Ref. Co.'s No. 2 O'Connor, John Keating Sur., 923 ft. N, 20° E of No. 1 ..... Derrick.

**SAN JACINTO COUNTY**

E. P. Edwards' No. 1 J. R. Bennett, Cold Springs ..... Shut down 750 ft.

**TRINITY COUNTY**

Scientific Producers Co.'s No. 1 Thompson, L.&G.N. Sur. No. 47, 50 ft. out of NE cor. of H. K. Thompson 199-acre tract ..... Shut down for repairs 1,175 ft.

**TYLER COUNTY**

King Oil Co.'s No. 1 Caswell ..... Sand and shale showing oil 1,255 ft.; cem. 6-in. casing 1,230 ft.; standing.

Allied Pet. Co.'s (Texas Southern Pet. Co.) No. 3 Wilson, Mrs. E. Cherry Sur. No. 798, 1,500 varas from W line and 600 varas from N line ..... S.D. 5,025 ft.

**VICTORIA COUNTY**

Bunte et al's No. 1 Keeran, 3,714 ft. NE along railroad from SW line of Martin DeLeon Sur., and thence 1,600 ft. NW at right angles ..... Shut down 4,672 ft.

Houston Oil Co.'s No. 1 Conrad, T.&N.O. Sur. No. 1, 1,100 ft. from SW line and 100 ft. from NW line.... Heaving shale 5,290 ft.; cem hole to 4,656 ft.

The Texas Company's No. 3 McFaddin, S 15 deg. W 6,300 ft. and N 75 deg. W 1,850 ft. out of NE cor. John M. Rine Sur. ..... Cored sand showing oil 5,457-81 ft.; cem. casing.

**WALKER COUNTY**

Hart Oil Co.'s No. 1 Thompson Lbr. Co., Jose Ortega Sur., 1,265 ft. S, 1,876 ft. W of SW cor. of J. B. Gibson's 71-acre tract ..... Shut down 1,578 ft.

**WALLER COUNTY**

McDaniel and associates' No. 1 Citizens State Bank, B.B.B.&C. Sur., C of 150-acre tract ..... No report.

**WASHINGTON COUNTY**

Moon & Yeager's No. 1 Hahn, 500 ft. from N line and 1,852 ft. from W line of J. H. Alcorn Sur., Abst. 3.. Drill stem stuck 3,635 ft.
Penn-Tex Oil Co.'s No. 2 Kamah Brenham, S. M. Williams Sur. .. Lime and anhydrite 3,550 ft.; shut down.

**SOUTH LOUISIANA**
**ASCENSION PARISH**

McElroy Pet. Co.'s No. 2 Lacey, 150 ft. S, 150 ft. W of NE cor. of Sec. 29-10s-4e .. S.D. 4,515 ft.

**CALCASIEU PARISH**

Crawford Doyle's No. 1 Johnson, Sec. 23-9s-13w .. Shut down 875 ft.
L. O. Davis' No. 1 Industrial, Sec. 29-9s-10w .. Standing 6,568 ft.
Wilfred Lahay's No. 1 Jardell, Sec. 16-10s-12w .. Shut down 3,650 ft.
Success Oil Co.'s No. 1 Hewitt, 90 ft. out of SW cor., Sec. 11-9s-11w .. Rig.

**EVANGELINE PARISH**

Emile LeDeau's No. 1 Vidrine, 280 ft. W and 350 ft. S of NE cor. of Sec. 47-3s-2e .. Rig.

**IBERIA PARISH**

Jefferson Lake Oil Co.'s No. 25 Lake Peigneur, Sec. 53-12s-5e, 400 ft. N of No. 24 .. Abandoned sulphur test.
Jefferson Lake Oil Co.'s No. 26 Lake Peigneur, Sec. 53-12s-5e, 950 ft. N, 73° 6" W of No. 8 .. Sulphur test.

**IBERVILLE PARISH**

Standard Oil Co.'s No. 2 Myrtle Grove-Wilbert, Bayou Choctaw, 2,940 ft. N and 600 ft. W of C of Sec. 52-9s-11e .. Building derrick.
Standard Oil Co.'s No. 2 Gay, Bayou Choctaw, 4,500 ft. N and 600 ft. E of SW cor. SE of Sec. 52-9s-11e .. Drlg. sand 2,700 ft.
Standard Oil Co.'s No. 7 Schwing, Bayou Blue, 1,359 ft. N and 1,356 ft. E of C of Sec. 74-9s-10w .. Formerly temp. aband. 1,350 ft.; preparing to resume drilling.

**LA FOURCHE PARISH**

State Prod. Co.'s No. 1-B Stark, 1,921 ft. E and 1,540 ft. S of NW cor. of Sec. 71-15s-15e .. Sulphur test.
State Prod. Co.'s No. 1-C Stark, 210 ft. S and 140 ft. E of NW cor. of Sec. 71-15s-15e .. Sulphur test.
The Texas Company's No. 3 La.L.&E., Leesville, 4,439 ft. S and 468 ft. E of NW cor. Sec. 26-21s-22e .. Total depth 3,681 ft.; set 7⅛ ft. screen; comp. flowing 1,500 bbls. pipe line oil daily, 345 lbs. pressure, through ½-in. choke.

**PLAQUEMINES PARISH**

Humble Oil & Ref. Co.'s No. 5 Cockrell-Moran, Lake Grand Ecaille, 10,377 ft. N and 2,614 ft. W of NE cor. of Twp. 21s-26e .. Location.
Humble O. & R. Co.'s No. 7 Cockrell-Moran, Sec. 14-20s-26e, 400 ft. S of No. 4 .. Location.

**POINTE COUPEE PARISH**

Grand Bay Oil & Gas Co.'s No. 1 Moniotte, 10,140 ft. S and 13,450 ft. E of NW cor. Twp. 5s-11e in Sec. 94... Shut down 200 ft.

**TERREBONNE PARISH**

La. Gas & Fuel Co.'s No. 2 Minor, 3,480 ft. S and 1,980 ft. E of NW cor. Sec. 3-18s-16e .. Cored sand showing gas 3,878-8 ft.; cem. casing 3,878 ft.; drilled plug and made drill stem test showing 50,000 ft. gas and salt water; recemented casing.
The Texas Company's No. 5 State, Dog Lake, 2,270 ft. S and 450 ft. E of NW cor. of Sec. 5-22s-16e .. Location.
The Texas Company's No. 4 La.L.&E., Bay Junop .. Location.
The Texas Company's No. 5 State, Lake Pelto, 1,505 ft. N and 1,539 ft. W of SE cor. of Sec. 8-22s-18e.... Waiting rig.
The Texas Company's No. 10 State, Lake Barre .. Location.
The Texas Company's No. 12 State, Lake Barre .. Location.
The Texas Company's No. 14 State, Lake Barre .. Location.
The Texas Company's No. 1 La.L.&E., Lake Barre, 2,645 ft. S and 595 ft. E of NW cor. Sec. 30-21s-20e .. Drlg. gumbo 2,212 ft.

**VERMILLION PARISH**

Pure Oil Co.'s No. 2 Alliance Trust Co., Gueydan, 1,875 ft. E and 950 ft. S of NW cor. of Sec. 34-11s-1w .. Building derrick.

**WEST FELICIANA PARISH**

Putnam Syndicate's No. 2 Como Plantation, Sec. 51-1s-4w. No report.

## LOUISIANA-ARKANSAS PROVEN AREAS

(Continued from Page 38)

O. J. Baird's No. 1 Duggan, Sec. 14-7-11, 328 ft. S, 648 ft. E, from C of Sec. .. Set 6-in. 2,410 ft; T.D. 2,461 ft.
Roy Baker's No. 1 Sabine Lbr. Co., Sec. 1-7-12 .. W.O.S.R. 2,548 ft.
W. M. Coates' No. 1 Bowman-Hicks, 330 ft. S and W, of C, Sec. 3-7-12 .. W.O.S.R. 2,441 ft.
O. A. Gautier et al's No. 1 Mischell, 330 ft. E, 150 ft. N, SW cor. SE NW, Sec. 30-8-12 .. S.D; W.O. 2,532 ft.
Hawkins & Antoon's No. 1 Newton, Sec. 1-7-11 .. W.O.S.R. 2,609 ft.
Hudson & Bird's No. 1 Walden, 480 ft. N, 300 ft. E, SW cor. SW NE, Sec. 26-8-11 .. Reaming to test 2,250 ft.
M. J. Kisick's No. 1 Brown Lbr. Co., Sec. 1-7-11, 1,070 ft. S, 1,225 ft. E, NW cor. NE .. Set 6-in. 2,400 ft.
Zeke Lohman's No. 1 McCormick, 660 ft. E, 330 ft. N, SW cor. NE SW, Sec. 2-7-11 .. S.D. 1,606 ft.
Loring Oil Co.'s No. 18 Bowman-Hicks, 1,280 ft. S, 275 ft. E, NW cor. SW NW, Sec. 15-7-12 .. Reaming to bottom 4,375 ft.
L. K. McGuffin's No. 1 Bush, NW cor. NW SE, Sec. 1-7-11 .. Set 6-in. 2,403 ft.
Ben Merritt, tr.'s No. 2 Byrd, Sec. 1-7-11 .. Reaming 2,480 ft.
Ohio Oil Co.'s No. 11 Bowman-Hicks, Sec. 2-7-11, 330 ft. N, 990 ft. E, SW cor. NW .. Drlg. 100 ft.
H. W. Perritt's No. 6 Bowman-Hicks, Sec. 2-7-12, 150 ft. S and W, NE cor. SE NE .. W.O.S.R. 2,317 ft.

**UNION PARISH**

Stovall Gas Co.'s No. 2 Howard, Sec. 32-20-3e, 1,320 ft. S, 1,980 ft. W, NE cor. .. S.W. and abd. 2,399 ft.

**ARKANSAS**
**UNION COUNTY—EL DORADO**

Ark. O. & G. Co.'s No. 4 Anderson, Sec. 31-17-15, 2,005 ft. S, 150 ft. W, NE cor. NW SW .. Set 6-in. 2,149 ft.
Lion O. & R. Co.'s No. 9-A G. P. Hayes, 242 ft. S, 246 ft. W, NE cor. Lot 5, NE, Sec. 4-16-15 .. S.D; high wtr. 7,255 ft.
Southern Prod. Co.'s No. 1 Wingfield, NE cor. SE NW, Sec. 16-19-15 .. S.D. 2,608 ft.

**UNION COUNTY—URBANA**

Marine Oil Co.'s No. 1 Winn est., 330 ft. S and E, NE cor. S½ NW, Sec. 11-18-13 .. T.A. 3,586 ft.
Marine Oil Co.'s No. 2-E Thompson, 330 ft. N, 330 ft. E, SW cor. NE NE, Sec. 10-18-13 .. Location.
Wilson & Chapman's No. 1-B Hadley, Sec. 3-18-13, 330 ft. S and W, NE cor. SE NW .. D.S. stuck 3,542 ft.

**HARRISON COUNTY**

Calatex O. & G. Co.'s No. 6 Argus, 755 ft. N, 699 ft. W of Mile Post No. 27, W. Mack Sur. .. Set 6⅝-in. 2,340 ft.

**EAST TEXAS**
**PANOLA COUNTY**

Daisy O. & G. Co.'s No. 1 Rucks, Jno. Palmer Sur.... S.D. 3,194 ft.
Nat. Gas Prod. Co.'s No. 3 Mays, 158 ft. S, 442 ft. W, NE cor. 42.5-ac. tr., Jane Thorpe Sur. .. Rigging up.
United Prod. Corp.'s No. 17 Steele, 1,320 ft. N, 660 ft. W, SE cor. C. D. Steele lse., in B. C. Jordan Sur. .... Location.

**MISSISSIPPI**
**HINDS COUNTY**

Ferguson-Fuller et al's No. 1 Sours et al, Sec. 34-6n-1e, 665 ft. E, 50 ft. S, NW cor. SW .. Completed for 43,019,000 ft. gas 2,427 ft.
Love Pet. Co.'s No. 1 Interior Lbr. Co., Sec. 2-5n-1e, 90 ft. W, 270 ft. N, SE cor. SW .. Derrick.
Millsaps College's No. 1 fee, Sec. 34-6n-1e, 2,225 ft. N, 1,412 ft. W, SE cor. Sec. .. Drlg. 815 ft.

**RANKIN COUNTY**

Jas. Alexander, tr.'s No. 1 Hurst, Sec. 12-5n-1e, 200 ft. N, 700 ft. W, SE cor. NE NE .. Derrick.
Anderson et al's No. 1 Brown, Sec. 12-5n-1e, 166 ft. E, 788 ft. S of C, Sec. .. Bailing 2,402 ft.
Anderson et al's No. 1 Casey & Wellon, Sec. 11-5n-1e, 656 ft. N and W, SE cor. Sec. .. Set 10-in. 121 ft.
Baker-Owens et al's No. 1 Gulf State Creosoting Co., Sec. 12-5n-1e, 94 ft. E, 1,200 ft. N of SW cor. .. Set 6⅝-in. 2,383 ft.
Cummins & Montgomery's No. 1 Ivey, Sec. 13-5n-1e, NE Lot 10, Blk. D, E. Jackson Pl., First Addn. .... Derrick pattern.
Meredith et al's No. 1 Strowder, Sec. 12-5n-1e, SE cor. SW NE .. Derrick.
Muse & Muse's No. 1 Seany, Sec. 12-5n-1e, 2,670 ft. E, 375 ft. S, NW cor. SW .. Completed estimated 35,000,000 ft. gas 2,391 ft.
Pioneer O. & G. Co.'s No. 1 Green, Sec. 12-5n-1e, 180 ft. W, SE cor. SW SW .. Set 6⅝-in. 2,391 ft.
Pioneer O. & G. Co.'s No. 1 C. M. Motor, Sec. 12-5n-1e, 937 ft. N and E, SW cor. Sec. .. Set 6⅝-in. 2,387 ft.

## WILDCAT OPERATIONS IN MISSISSIPPI

**CLARKE COUNTY**

| Company, farm and location— | Remarks: |
|---|---|
| Gulf Ref. Co.'s No. 1-A Long Bell Lbr. Co., C SW SW, Sec. 10-2n-16w | Drlg. 5,927 ft. |

**HINDS COUNTY**

Atkins et al's No. 1 Crane Lawrence, Sec. 23-6n-1e, 300 ft. E, 132 ft. N, SW cor. NE SE .. Derrick.
Consumers O. & G. Co.'s No. 1 Interior Lbr. Co., 805 ft. E, 205 ft. N, SW cor., Sec. 1-5n-1e .. Drlg. 750 ft.
Howard Oil Co.'s No. 1 Jackson College, C NW NW, Sec. 9-5-1e .. S.D. 74 ft.
Ridgeway & McGehee, Inc.'s No. 1 Mosal, Sec. 24-6n-1e, 200 ft. N, 100 ft. E, SW cor. of E½ SW .. Drlg. 1,592 ft.
Roell O. & G. Co.'s No. 1 Dreyfuss, 650 ft. N, 480 ft. W, SE cor. NE, Sec. 4-5n-1e .. Drlg. 1,280 ft.
Southern Pet. Co.'s No. 1 Wilson (was Tri-State O. & G. Co.'s), 320 ft. E, 240 ft. N, SW cor. SE NE, Sec. 28-6-1e .. Waiting orders 2,498 ft.
F. E. Stewart et al's No. 1 Miss. Cotton Seed Products Co., Sec. 4-5n-1e, 320 ft. S, 440 ft. W, NE cor. SE .. Derrick.

**JASPER COUNTY**

Bay Springs Pet. Co.'s No. 1 Keyes, C NW NE, Sec. 2-12-9 .. Drlg. 2,900 ft.

**LOWNDES COUNTY**

Lowndes County Oil & Dev. Co.'s No. 1 Carr est., Sec. 34-17-16e, 1,320 ft. E, 330 ft. S, NW cor. Sec. .. Derrick.

**MONROE COUNTY**

Amory Dev. Co.'s No. 1 Bourland, Sec. 2-13-19 .. S.D. 3,015 ft.
McAlpine et al's No. 1 Cowart, second hole, Sec. 2-12-19. T.A. 3,793 ft.

**NEWTON COUNTY**

Bob Dalton's No. 1 Majure, 400 ft. N, 300 ft. E, SW cor. SE, Sec. 25-6n-11e .. S.D. 840 ft.

**NOXUBEE COUNTY**

Thompson & Donohue's No. 1 Donohue, Sec. 25-16n-17e.. S.D. 1,735 ft.

**RANKIN COUNTY**

Attkisson & Dyer's No. 1 Valentour, 200 ft. S, 200 ft. E, NW cor., Sec. 18-5n-2e .. Waiting on csg. 2,428 ft.
Gulf Ref. Co.'s No. 1-A Hanna, Sec. 23-6n-1e .. Drlg. 4,651 ft.
Majestic O. & G. Co.'s No. 1 Elton Lbr. Co., Sec. 10-4n-3e. Derrick.

**SCOTT COUNTY**

M. U. Culley et al's No. 1 Owens, Sec. 2-8-9 .. Derrick.

**WARREN COUNTY**

Eagle Bend O. & G. Co.'s No. 1 Kiger, SW cor. SW SE, Sec. 9-18-2 .. S.D. 2,607 ft.
United Gas Public Service Co.'s No. 1 Tchula Co-Operative Store, 1,980 ft. W, 660 ft. N, SE cor. SE, Sec. 33-15n-3e .. Dry and abd. 4,008 ft.

## WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Continued from Page 38)

R. A. Keaton's No. 1 Stephens, Sec. 25-10-6, 320 ft. N and W, SE cor. NW NW .. S.D. 178 ft.
Mid-West Prod. Co., Inc.'s No. 1 H. Brown, Sec. 34-11-10, 200 ft. W, 230 ft. S, NE cor. SE .. S.D. 1,185 ft.
C. M. Talley et al's No. 1 C. M. Talley, 1,980 ft. W, 660 ft. S, NE cor. SE, Sec. 29-11-10 .. S.D. 1,380 ft.

**OUACHITA PARISH**

Wilson & Mitchell's No. 1 Williams, Sec. 5-16-1e, 330 ft. E, 240 ft. S, NW cor. SW SE .. Drlg. 1,200 ft.

**RED RIVER PARISH**

La. Oil Dev. Co.'s No. 2 La. Delta Pecan Co., 2,950 ft. S, 300 ft. E, NW cor., Sec. 27-13-11 .. Spudded and S.D. 50 ft.
Mack Jourden Co.'s No. 1 Lockett, 4,035 ft. S, 1,080 ft. E, NW cor. SW, Sec. 29, in Sec. 33-13-10 .. W.O.S.R. 2,750 ft.

**RICHLAND PARISH**

Alto Gas Co.'s No. 2 Hunt, 660 ft. S and E, NW cor., Sec. 13-17-5 .. Derrick.
National Gas Co.'s No. 1 Singletary, 1,980 ft. N, 660 ft. W, SE cor., Sec. 20-18n-7e .. S.D. 2,515 ft.
Southern Carbon Co.'s No. 1-B C. M. Noble, 2,966 ft. N, 1,525 ft. W, cor. Secs. 7, 8, 17 and 18, in Sec. 37-15-6.. Location.

**SABINE PARISH**

Abney & Davidson's No. 1 Frank Martinez, 330 ft. S and W, NE cor. NW, Sec. 11-7-13 .. Derrick.
Beene et al's No. 1 Eternack, Sec. 2-7-13, 1,070 ft. S, 250 ft. W, NE cor. .. S.D. for fuel 1,000 ft.
Beene et al's No. 1 Vincent, Sec. 6-7-10 .. Rigging up.
Coates Pet. Co.'s No. 1 Parle, Sec. 2-7-13, 300 ft. S and W, NE cor. NE SE .. Derrick.
W. M. Coates' No. 1 Stille, 330 ft. N, 660 ft. W, SE cor., Sec. 35-8-13 .. Derrick.
Davidson & Grigsby's No. 1 Martinez, Sec. 2-7-13, 330 ft. S and W, NE cor. NW SE .. Set 6-in. 2,037 ft.
Exchange Pet. Co.'s No. 1-B La. Long Leaf Lbr. Co., Sec. 35-8-11, 300 ft. N and E, SW cor. NE NW .. Dry and abd. 2,657 ft.
R. L. Gay, tr.'s No. 1-A Long Bell Lbr. Co., 430 ft. S, 200 ft. W, NE cor. NW NW, Sec. 10-8-13 .. Drlg. 4,135 ft.
Gehring Oil Co.'s No. 1 Skinner, Sec. 16-8-11, 615 ft. E, 565 ft. S, NW cor. NW .. Tested dry 2,777 ft; S.D; W.O.
W. F. Lacey's No. 1 Parle, 330 ft. S and W, NE cor. SW, Sec. 2-7-13 .. Rigging up.
T. M. LeGrand's No. 1 Peterson, 330 ft. N and E of C, Sec. 34-7-13 .. Arranging to set 6-in. 2,243 ft.
Geo. LeGrand's No. 1 McGough, Sec. 3-8-10 .. Derrick.
J. J. Keen, tr.'s No. 1 Belton (no check), Sec. 21-9-13.. S.D. 2,039 ft.
Ruston Drlg. Co.'s No. 1 McGehee, Sec. 28-8-12, 330 ft. N and W, SE cor. SW SW .. Derrick.
Smitherman & Grigsby's No. 1 Gardner, 330 ft. S and E, NW cor. NE NE, Sec. 12-7-11 .. Drlg. 770 ft.
A. H. Thames' No. 1 Edward est., 150 ft. NW SE cor. NE SE, Sec. 8-8-13 .. S.D. 1,200 ft.

**TENSAS PARISH**

A. R. Willis et al's No. 1 Currey, 1,320 ft. S, 1,320 ft. E, NW cor., Sec. 39-21-13 .. S.D. 3,545 ft.

**ARKANSAS**

**COLUMBIA COUNTY**

Kendall Oil Co.'s No. 1 Fullenweider, Rhea & Kitchen, Sec. 13-17-22 ..... S.D; W.O. 814 ft.

**CLAY COUNTY**

S. C. Jeffus' No. 1 Underwood, 510 ft. N, 350 ft. W, C, NW SE, Sec. 4-20-8 ..... S.D. 1,350 ft.

**CLEVELAND COUNTY**

Crum & Stillwell's No. 1 E. R. Bell, Sec. 10-10s-12w.... Rigged up and S.D.

**CLEBURNE COUNTY**
(Cable tools)

Donnelly-Craver et al's No. 1 Donophan Lbr. Co., SE cor. NW, Sec. 33-11-9..... S.D. 3,740 ft.

**DALLAS COUNTY**

E.C. Brewer's No. 1 W. E. Hillman, 330 ft. E, 40 ft. S, NW cor. SE NE, Sec. 20-10-13..... Dry and abd. 2,869 ft.
J. H. James, tr.'s No. 1 Fordyce Lbr. Co., 200 ft. S, 200 ft. E, NW cor. SE, Sec. 11-9-15..... S.D. funds 2,520 ft.
Zepp O. & G. Co.'s No. 3 Hillman, Sec. 20-10-13, 180 ft. N, 450 ft. E, SW cor. NW NE..... Location.

**DREW COUNTY**

Co-Operative Dev. Co.'s No. 1 Ogles, Sec. 35-15-5, 330 ft. S and E, NW cor. NE NW..... Drlg. 1,845 ft.

**HOT SPRINGS COUNTY**

Star Oil Co.'s No. 1 Cunningham, 285 ft. S, 285 ft. W, NE cor., Sec. 11-5-16..... S.D. 1,300 ft.

**LINCOLN COUNTY**

Lawrence Cook, tr.'s No. 1 McGhee Planting Co., 420 ft. S, 200 ft. W, NE cor. NE SW, Sec. 5-8-7..... S.D. 2,800 ft.

**LITTLE RIVER COUNTY**

Roberts Oil Co.'s No. 1 H. J. Russell, 330 ft. E, 330 ft. S, NW cor., Sec. 25-12-19..... Location.
Stephens et al's No. 1 Dierke Lbr. Co., Sec. 29-12s-21w, 150 ft. S, 330 ft. E, NW cor. NE NW..... Drlg. shale 1,140 ft.

**LOGAN COUNTY**

J. H. Flowers' No. 1 J. H. White, Sec. 13-6-26..... S.D.; W.O. 3,570 ft.

**MILLER COUNTY**

W. E. Noel et al's No. 1 Dickson hrs., 1,950 ft. W, 660 ft. S, NE cor., Sec. 11-20-27..... S.D. 1,955 ft.

**OUACHITA COUNTY**

Copenhaven et al's No. 2 Berg, C SE SE, Sec. 13-15-17 ... S.D. 2,011 ft.
Wilson & Chapman's No. 1 Lambert, Sec. 10-15-16, 600 ft. S, 150 ft. E, NW cor. SE SE..... Coring 2,366 ft.

**PIKE COUNTY**

E. R. Henderson's No. 1 Tilyou, 660 ft. W, 500 ft. S, NE cor. NE SE, Sec. 26-8-14..... T.A. 2,909 ft.
E. R. Henderson's No. 1 J. L. Lee, 400 ft. S, 350 ft. E, NW cor. SW SE, Sec. 31-8-24..... S.D; W.O. 1,020 ft.
E. R. Henderson's No. 1 W. B. East, 200 ft. S, 150 ft. W, NE cor., Sec. 13-9-23..... S.D. 338 ft.

**PRAIRIE COUNTY**

Powell Creek O. & G. Co.'s No. 1 Kloss, NE SW, Sec. 3-4n-6w ..... Partly rigged up and S.D.

**SCOTT COUNTY**

Heavener O. & G. Co.'s No. 1 Riser, Sec. 36-4-26..... S.D; T.D. 1,436 ft.
Waldron O. & G. Co.'s No. 1 White, NE cor. SW NW, Sec. 17-3n-29 ..... S.D. 1,860 ft.

**SEVIER COUNTY**

Tristate Oil Co.'s No. 1 McCown, Sec. 34-8-32, S½ SW.. Drlg. 600 ft.

**UNION COUNTY**

Drillers Oil & Dev. Co.'s No. 1 Pickering, 220 ft. N, 668 ft. E, SW cor. NW NE, Sec. 1-17-16..... Plugging hole 2,134 ft.
H. H. Helms' No. 1 C. H. Murphy, NE cor. NW NE, Sec. 31-16-14..... Rigging up.
L. M. Hill et al's No. 1 J. W. Barnes, Sec. 21-19-16, NE cor. Sec. ..... Location.
Modisette et al's No. 1 Union Sawmill Co., Sec. 13-18-13, 330 ft. S and E, NW cor. SW NW..... Rigging up.
Sunby et al's No. 2 Perdue, Sec. 33-16-14, 75 ft. S, 150 ft. E, NW cor. Sec. ..... W.O. 3,247 ft.

**WASHINGTON COUNTY**
(Cable tools)

C. H. Willoughby's No. 1 Jones, Sec. 34-16-30 ..... S.D. for funds 1,795 ft.

**YELL COUNTY**
(Cable tools)

Tegmeir & Luckett's No. 1 Falcon, Sec. 36-[illegible]-21..... S.D. 5,710 ft.

**EAST TEXAS**

**BOWIE COUNTY**

Logan & Elliott's No. 1 Smith, 9,600 ft. S, 2,500 ft. W, NE cor. Chas. Lewis Sur. ..... S.D. 4,505 ft.
Tarkington & Jones' No. 1 W. W. Whybark, 200 ft. S, 200 ft. W, SW cor. J. H. Dyer Sur. ..... S.D. 1,880 ft.
Lee Timberlake et al's No. 2 Tidwell, 2,510 ft. N, 655 ft. W, SE cor. T. M. Rice Sur. ..... S.D. 3,000 ft.

**CAMP COUNTY**

McDonald Bros.' No. 1 Tillery, 150 ft. E, 450 ft. S, NW cor. 127-ac. tr. in J. H. Murphy Sur. ..... S.D. 3,600 ft.

**CASS COUNTY**

J. F. Morrisey's No. 1 T. J. Wilson, 1,088 ft. S of N line, 2,376 ft. E of W line of H.R.S., J. R. McFarland Sur. ..... S.D. 3,670 ft.
Davis & Pigg's No. 1 Roy Bryan, SW cor. Roy Bryan 38-ac. tr., Albert H. Latimer Sur. ..... S.D. 2,055 ft.
Everets Drig. Co.'s No. 1 H. W. Whittington, 200 ft. S and W, NE cor. 69-ac. Whittington tr., L. Strong Sur.. S.D. 3,922 ft.
Geo. McKamie's No. 1 R. E. Hall, 150 ft. N, 150 ft. W, SE cor. Hall's 117-ac. tr., H. Buckler Sur. ..... S.D. 4,195 ft.
C. E. Murdock's No. 1 First National Bank, Evans Watson Sur. ..... S.D. 4,390 ft.
John C. Rogers' No. 1 I. E. Lanier, 573 ft. N, 879 ft. W, SE cor. Lanier 86 ac. in K. E. Welborn Sur. .... S.D. 2,280 ft.
Olds & King's No. 2 Anthony, John C. Byers Sur. ..... S.D. 1,750 ft.
John C. Rogers et al's No. 1 W. Q. Henderson, 3,100 ft. S, 3,100 ft. E, NW cor., Wm. Davis Sur. ..... S.D. 955 ft.

**HARRISON COUNTY**

Lloyd Oil Corp.'s No. 1 E. S. Timmons, 150 ft. from N line to 250 ft. from E line of 105-ac. tr., Findley Sur. ..... S.D. 4,195 ft.
Ryan Consolidated Pet. Corp.'s No. 1 J. M. Fuhr, 1,-300 ft. N of NW cor. T. J. Copelin Sur., 1,675 ft. SW at right angles to NW SE line of O'Neal Sur. .. Derrick.

**MARION COUNTY**

Geo. Hindeman et al's No. 1 F. V. Lindsey, 2,500 ft. S, most northerly N line, 2,555 ft. E most easterly W line, Alexander Albright Sur. ..... S.D. 2,380 ft.

**PANOLA COUNTY**

Hoffer et al's No. 1 Cameron Lbr. Co. center 1,306-ac. tr. in W. M. A. LaGrove Sur. ..... Derrick.
Moses & Wallace's No. 1 Daniel, 600 ft. N and W lines, Mrs. Gerrell 100-ac. tr., SW cor. Isabel Hanks Sur. .. Spudded and S.D.
G. A. Davidson's No. 1 Latham, Wm. Rich. Sur. ..... S.D. for fuel 2,010 ft.
J. L. Nelson et al's No. 1 J. W. Williams, 300 ft. S, 700 ft. W, NE cor. Williams' 67-ac. tr. in James Hanks Sur. ..... Reaming 2,875 ft.
United Gas Public Service Co.'s No. 11 Werner, 1,162 ft. N, 2,418 ft. W, SE cor. D. B. Lewis Sur. ..... Drlg. shale and lime 5,644 ft.

**RED RIVER COUNTY**

D. M. Buffington's No. 1 Hossler, E. Hughhart Sur. ..... S.D. 2,795 ft.
Johnson Pet. Co.'s No. 2 Randolph, Edw. Dean Sur. ..... S.D. 2,280 ft.

**RUSK COUNTY**

Chapperell Oil Co.'s No. 2 Holt, Matthew Moore Sur. ... Arranging to whipstock; T. D. 3,-127 ft.

**SHELBY COUNTY**

Harry Elliott's No. 1 Pickering Lbr. Co., 1,000 ft. N, 150 ft. E, SW cor. 361-ac. tr., G. H. Patterson Sur. .. Set 10-in. 108 ft.
K. H. Francis' No. 1 John Mims, Mary Smith Sur. ..... S.D. 3,334 ft.
H. H. Gracey's No. 1 J. A. Morrison, 1,500 ft. N, 200 ft. E, SW cor. J. A. Morris' 109-ac. tr., Wm. English Sur. ..... S.D. 2,600 ft.
Henry Maulding's No. 1 Frost Lbr. Co., NE cor. Frost Lbr. Co.'s 80-ac. tr., A. D. Fountain Sur. ..... S.D. 3,246 ft.
McRoby et al's No. 1 Windham, Wm. Leach Sur., on Windham 296-ac. tr. ..... S.D. high wtr. 3,393 ft.
Ridgeway et al's No. 1 Polley, Domingo Gonzales Sur., 3,180 ft. E of SW cor., 160 ft. N at right angles of Polley 457-ac. tr. ..... Set 8-in. 822 ft.
C. H. Tautenhahn's No. 1 J. C. Bogard, 300 ft. S, 900 ft. E, NW cor. J. C. Bogard's 52-ac. tr., Thomas Baker Sur. ..... S.D. 20 ft.
Tenant et al's No. 1 J. Henry, C. Z. Walker Sur. ..... S.D. 3,457 ft.
United North & South Prod. Co.'s No. 1 Windham, 800 ft. W, 1,050 ft. N, SE cor. of Windham 171.5-ac. tr. on A. H. English Sur. ..... S.D; W.O. 3,391 ft.

## WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 34)

**GARFIELD COUNTY**

E. L. Love et al's No. 1 White, SE cor. NW Sec. 9-24-6w.. S.D. 5,850 ft.

**GARVIN COUNTY**

Malarnee et al's No. 1 Phillips, NE SW SE Sec. 24-2-2w.. S.D. 4,830 ft.

**GREER COUNTY**

Dovell et al's No. 1 Capell, NW cor. Sec. 1-7-22w ..... 5,000,000 ft. gas 1,455-65 ft; T.D. 1,760 ft.
French's No. 1 Murphy, SW NW Sec. 23-7-21w ..... S.D. 1,645 ft.

**HARPER COUNTY**

Sinclair O. & G. Co.'s No. 1 Howell, C SW SW, Sec. 14-26-24w ..... 20,000,000 ft. gas 5,350-5,400 ft; T.D. 5,539 ft; S.D; sprayed 50 bbls. gasoline.

**HASKELL COUNTY**

Ault et al's No. 1 Harrison, CWL SE NE, Sec. 14-9-19.. S.D. 650 ft.
Ault et al's No. 1 Hall, NW SW SW, Sec. 14-9-19 ..... S.D. 2,000 ft.
Ault et al's No. 1 Hall, SE NW, Sec. 25-19-9 ..... S.D. 200 ft.
Holden's No. 1 Phillips, SE cor., Sec. 3-9-18e ..... S.D. 1,860 ft.
Marion Oil's No. 1 Sanders, NW NE NW, Sec. 10-9-18e.. S.D. 2,387 ft.

**KAY COUNTY**

W. H. Atkinson et al's No. 1 Hayes, SE NE, Sec. 24-28-3.. Drlg. 1,215 ft.
Lewis et al's No. 1 Harris, SE NW, Sec. 14-25-1 ..... Location.
Mummert Drgl. Co. et al's No. 1 Cormick, C NW SE, Sec. 9-27-2 ..... S.D. 3,693 ft.
Blackwell Oil Co.'s No. 1 Harshman, Sec. 2-26-1w ..... Rig on ground.

**KIOWA COUNTY**

Christian's No. 1 Jones, NE SE, Sec. 5-7-15w ..... S.D. 820 ft.

**LATIMER COUNTY**

Choctaw Oil Co.'s No. 1 Fitzgerald, C NW NW, Sec. 1-6-22. Sand 1,910-50 ft.; shot and completed for 3,500,000 ft. of gas.
P. English's No. 1 Unknown, NW SE, Sec. 16-6-19 ..... S.D. 1,542 ft.

**LE FLORE COUNTY**

Dowd et al's No. 2 Thomas, SE NE, Sec. 16-3-22 ..... Drlg. 1,050 ft.

**LINCOLN COUNTY**

Hilton Phillip's No. 1 Phillips, SW NW, Sec. 2-14-3 .... Fishing 4,840 ft.
Mote et al's No. 1 School Land, NW cor., Sec. 36-17-5 .. 1,160 ft.; S.D.

**McINTOSH COUNTY**

Patterson et al's No. 1 Smith, SW cor. NW SE, Sec. 32-9-16 ..... Drlg. 5,865 ft.; top Wilcox 5,440 ft.; top Siliceous 5,680 ft.

**MURRAY COUNTY**

Capitol Prod. Co.'s No. 1 Cutchall, SE NE, Sec. 6-1-2 .... S.D. 2,425 ft.

**MUSKOGEE COUNTY**

Sioux Oil Co.'s No. 1 Unknown, NW SE, Sec. 21-11-19 .. S.D. 1,011 ft.

**OKFUSKEE COUNTY**

Shepard et al's No. 1 Neveas, SE NW SW, Sec. 3-12-10.. S.D. 3,638-90 ft; Wilcox sand. hole full wtr.

**OKLAHOMA COUNTY**

Citizens Oil Co.'s No. 1 Sage Barber, NE cor., Sec. 21-11-3w ..... S.D. 1,200 ft.
L. C. Hivick's No. 1 Sunset Addition, NW SW NW, Sec. 17-11-3w ..... S.D. 5,515 ft.

**PAWNEE COUNTY**

Rookstool's No. 1 Wylie, NW NE SW, Sec. 6-20-5 ..... S.D. 1,950 ft.
Cochran et al's No. 1 Green, NE cor. SW, Sec. 15-23-5.. Rig.

**PITTSBURG COUNTY**

Tape Oil Co.'s No. 1 Fulton, SE, Sec. 34-7-14 ..... S.D. 1,200 ft.
J. Morrison's No. 1 Fowler, NE SE, Sec. 13-7-17 ..... Rig.
C. Kennedy's No. 1 Travis, C SW NE, Sec. 15-7-14 ..... Rig.
C. Canady's No. 1 Jones, NW cor., Sec. 14-8-14 ..... Rig.

**ROGER MILLS COUNTY**

Ute Oil Co.'s No. 1 Williams, C SW, Sec. 23-12-24w ..... C.O. 5,150 ft.
L. C. Hivick's No. 1 Davis, C NW NE, Sec. 4-11-24w .... S.D. 3,375 ft.

**SEQUOYAH COUNTY**

Braman Oil Co.'s No. 1 Unknown, C NW SW, Sec. 29-12-22 ..... T.D. 1,365 ft.; S.D.

**WAGONER COUNTY**

J. A. Barbee's No. 1 Childers, CWL NW SW, Sec. 28-18-17 ..... S.D. 875 ft.

**WASHITA COUNTY**

Miley Pet. Co.'s No. 1 Wolfe, NE SW, Sec. 23-9-17w.... Location.
Cooper & Terhune's No. 1 Blocker, NW cor., Sec. 29-8-19w ..... Drlg. 2,740 ft.; show oil 2,459-67 ft.; S.D. 2,757 ft.
Burns & Prince's No. 1 Deck, SW cor., Sec. 21-8-18 ..... S.D. 1,140 ft.

**OKLAHOMA PANHANDLE**

**TEXAS COUNTY**

Three Way Oil Co.'s No. 1 Crane, SW NW, Sec. 11-1-1S.. T.D. 4,720 ft., to cement.

**SOUTHERN OKLAHOMA**

**ATOKA COUNTY**

Morris et al's No. 1 Mansell, SW NW NW, Sec. 9-2s-12 .. S.D. 285 ft.
Brookshire's No. 1 R. W. Rowland, NW NE SE, Sec. 18-2s-10 ..... Landed 10-in. at 1,530 ft.

**BRYAN COUNTY**

Bryan County Oil's No. 1 Childs, NW SE SW, Sec. 7-7-10. T.D. 650 ft.
Bush et al's No. 1 Commerce Trust, NE cor., Sec. 35-6s-9 ..... T.D. 740 ft; plugged back to 480 ft.
Whalen et al's No. 1 Mason, NW SE SW, Sec. 24-6s-9... S.D. 430 ft.

**CHOCTAW COUNTY**

Hobson Bros.' No. 1 McChristian, NW NE NE, Sec. 12-6s-19 ..... S.D. 730 ft.

**JEFFERSON COUNTY**

Smith's No. 1 McCarty, SE NW NE, Sec. 18-4s-8w ..... Location.

**LOVE COUNTY**

Van Vleck's No. 1 Sheldon, NE SE NW, Sec. 14-8s-24 ... S.D. 2,060 ft.
Autrey et al's No. 2 Cross, CWL SE NE, Sec. 27-6s-2 ... Show oil and gas 970-72 ft. and 1,324-34 ft.; S.D. 1,651 ft.

**MARSHALL COUNTY**

Everette et al's No. 1 Agres, SE NE, Sec. 14-7s-6 ..... S.D. 1,170 ft.;
Summers-Sellers' No. 1 Beams, NE SW NE SW, Sec. 20-7s-5 ..... Rig.
Newman et al's No. 1 Henry, NW cor., Sec. 22-7s-6 ..... Rig.
Taliaferro et al's No. 1 fee, NW SE SE NW, Sec. 34-5s-5 ..... Abd. 915 ft.

**McCURTAIN COUNTY**

Prassell et al's No. 1 Wagoner, SE NE, Sec. 5-8s-27.... S.D. 150 ft.
Stampfs et al's No. 1 Harris, SW NW SW, Sec. 14-9s-25.. Drlg. 1,900 ft.
Stewart's No. 1 Patterson, C SE SE, Sec. 7-4s-24 ..... Drlg. 900 ft.

**PUSHMATAHA COUNTY**

George's No. 1 Lane, NW SE Sec. 32-3s-15 ..... Abd. 840 ft.
George's No. 1 Ryan, NW SW NE, Sec. 31-3-15..... Rig.
Whitehead et al's No. 1 Messer, SE SW SW, Sec. 35-3s-18 ..... S.D. 340 ft.

**STEPHENS COUNTY**

Brown's No. 1 Hightower, SW SE NE, Sec. 15-2s-6w .... Sand 990-1,004 ft; S.O; S.D.

## KANSAS FIELDS

(Continued from Page 37)

they own considerable royalty surrounding the little tract, and set out to prove their royalty holdings.

**Revival in Cowley County**

Considerable interest is developing in the State Pool at Winfield, in Cowley County, where a new deep pay horizon has been found. An old gas well, Roth & Faurot's No. 1 Wilcoxen, NE cor. SE NW, Section 22-32-4, on the north edge of Winfield Townsite, was drilled deeper, making 1,100 bbls. in 14 hours from the Silicious lime at 3,300-06 feet. It was formerly a gas well at a total depth of 2,960 feet. The deep sand was discovered by Earl Wakefield several months ago. The well made around 700 bbls. a day.

The second well to reach the Silicious lime was Roth & Faurot's No. 1 on Lot 1, Block 41, Highland Park Addition, in Section 22-32-4, flowing 250 bbls. a day from the Silicious lime at 3,286-96 feet. It was completed December 2.

Prairie Oil & Gas Co.'s No. 1 J. W. Dibbens in Section 22-32-4 is estimated to be good for 150 bbls. of oil from the Silicious lime at 3,298-3,304 feet. Eight other tests were either drilling or rigging up in the area.

**Barton County**

Mid-West Refining Co.'s No. 8 Berscheidt, C NW SE, Section 12-20-11w, has set surface pipe and waiting on cement to set.

**Butler County**

Magnolia Petroleum Co.'s No. 68 Kooger, SW cor. NE NW, Section 30-26-5, has been completed for 50 bbls. in sand 2615-38 feet.

**Cowley County**

Roth & Faurot's No. 4 Winfield Townsite, Lot 4, Block 38, College View addition, Section 22-32-4, is rigging up to deepen from 2,973 feet. Knox Drilling Co. and others' No. 1 Mattison, Lot 11, Block 44, Musgrove addition to city of Winfield, Section 22-32-4, is spudding. Slocum and others' No. 1 Pudden, C SW NE, Section 16-35-4, is a machine. McKnabb and others' No. 2 Wallace, Lot 3, Kirkbride addition to city of Winfield, Section 22-32-4, an old well deepened to Siliceous lime at 3,300-12 feet, has been completed for 75 bbls. No. 1 Brane, Lot 4, Kirkbride addition to city of Winfield, Section 22-32-4, has been deepened to Siliceous lime at 3,297-3,310 feet and completed for 450 bbls.

**Ellsworth County**

Derby Oil Co. is moving the rig in for No. 1 Stratman, NE cor. NW NE, Section 12-17-10w.

**Greenwood County**

Syndicate Oil Co. and Phillips Petroleum Co.'s No. 3 Edwards, SE cor. NW NE, Section 35-23-11, is spudding. McGinnis and others' No. 1 Hawthorne, SE cor. SW NW, Section 2-25-10, is spudding. Empire Oil & Refining Co.'s No. 1 Lewis, NE cor. SW SW, Section 9-24-12, is dry and abandoned at 1,765 feet.

**McPherson County**

Stanolind Oil & Gas Co. and Olsen Drilling Co. made location for No. 1 Johnson, NW cor. SE, Section 28-19-1w, and now building the rig. Helmerick and Payne and Shell Petroleum Corp. made location for No. 1 Russell, NE cor. SW SE, Section 12-19-2w. Western Gasoline Corp. and Shell Petroleum Corp. made location for No. 1 Wall, NW cor. SW SE, Section 21-21-3w. H. C. Finefrock and others' No. 1-A Rolander, SE cor. NW SW, Section 30-18-2w, has been deepened to 3,278 feet and completed for 50 bbls.

**Russell County**

Mid-West Refining Co.'s No. 18 Brundrdt, SW cor. NW NW, Section 31-12-13w, has been deepened to 3,148 feet and then plugged back 2 feet and completed for 185 bbls.

**Sedgwick County**

Continental Oil Co.'s No. 1 Casey, SW cor. NW, Section 15-25-1e, has been completed for 402 bbls. in sand at 2,614-16 feet. National Refining Co. and others' No. 1 Murdock, SW cor. SE SE, Section 19-27-2 Eastborough Pool, has been deepened from 2,965 feet to 3,256 feet in Viola lime topped at 3,240 feet and completed for 240 bbls. after plugging back 2 feet. Derby Oil Co.'s No. 3 Eastborough, SW cor. NE NW NE, Section 19-27-2, has been deepened from 2,987½ feet to Viola lime at 3,279½-80½ feet and pumped 700 bbls. Magnolia Petroleum Co.'s No. 2 Wheeler, NW cor. NE NE, Section 19-27-2, has been deepened from 2,970 feet to sand at 3,225-31 feet and completed for 550 bbls. on the pump.

**Stafford County**

Mid-West Refining Co. and others made location for No. 8 Brock, C NW NW, Section 6-23-11w. The rig is being built for No. 11 Figger, C NE NE, Section 1-23-12w.

## CANADIAN FIELDS

(Continued from Page 44)

a considerable distance north of the Turner Valley Field. The only previous test of any consequence in this area was Monarch Oil Co.'s deep well, drilled at the time of the Calgary boom in 1914 and which finished at a depth considerably below 4,000 feet. The Monarch test was reported to have got some oil and gas shows at various depths, but failed to secure commercial production, and apparently did not come within striking distance of the Madison lime, which later proved the important producing horizon in the Turner Valley Field.

As drilling in the Monarch area starts in the Belly River formation, the belief has been generally entertained that the Madison and Devonian horizons were too deeply buried to be reached by the drill; and it has also been estimated that Cartier-Majestic's No. 1 was 600 feet deeper owing to its location on the west flank of the structure. In the actual drilling, however, Cartier-Majestic's No. 1 got a shale formation, identified as the Claggett-Benton, between 975 and 980 feet; this formation was encountered on the old Monarch well around 2,400 feet, indicating that the present test is 1,475 feet higher on structure. In the shale a fair show of crude was met at 1,060 feet before drilling shut down for the holidays.

In the overlying Belly River formation, in horizons where the geologists anticipated water, Cartier-Majestic's No. 1 has encountered traces of heavy crude. A typical Turner Valley log would show the Benton 2,200 feet thick, with oil possibilities in the cardium and black band horizons; 600 feet of Dakota-Blairmore, with several sands including the Stockman and McDougall-Segur; 300 feet of Kootenay, with oil possible in the Home as well as some stray sands; and 500 feet of the Fernie, with the Dalhousie sand the most important potential horizon. With 200 feet of Mississippi limestone, this would leave 3,800 feet between the top of the Benton and the top of the Madison lime, indicating that the Cartier-Majestic's No. 1 might reach the producing horizon in the lime within 4,800 to 5,000 feet of drilling. Indications are, however, of a thinning of the Benton, Kootenay and Fernie formations to the north, with a prospect that the well will actually reach the Madison inside 3,900 feet. The developments indicate that not merely the Monarch area but all the structures between the Big Red Deer River and the Bow River have prospects which heretofore have been discounted on the theory that the Madison limestone was beyond reach of the drill.

**Border Fields of Alberta**

On the Alberta end of the international Reserve Dome structure, Mayland Southern's No. 1, LSD 13, Section 4-1-9w4, has suspended drilling till spring owing to severe weather conditions. The test is bottomed at 2,750 feet with casing run to 2,720 feet. Several large commercial gas flows have been struck.

Severe weather has interfered with drilling operations throughout the southern Alberta border area, and most of the tests have shut down temporarily for the holidays. In the Milk River area, Commonwealth Petroleums' No. 1, LSD 8, Section 9-3-15w4, is in the Devonian lime at 5,100 feet. Following a recent inspection by E. Michener, president of the company, and Dr. J. O. G. Sanderson, geologist, contract has been let to a Calgary firm to complete the test with rotary equipment. This is the first deep test of the Devonian in the border area and the only test in the province now working in that formation.

**Hudson's Bay Test**

In the Keho Lake district, Hudson's Bay Oil & Gas Co.'s No. 1 Keho, LSD 2, Section 17-11-22w4, is making progress with a fishing job at 4,920 feet, having recovered part of the string. As soon as the hole is clear, a production test will be made of the oil show encountered in the top of the Madison lime.

**Abandoned Deep Well**

The latter days of 1931 have been marked by the gradual disappearance from the southern Alberta landscape of the derrick and camp of Alberta Pacific Consolidated Oils' No. 1 Spring Coulee, in LSD 12, Section 15-4-23w4. It established a depth record for the border fields, reaching a maximum of around 6,195 feet, where it was only about 250 feet in the Madison lime, so that Commonwealth Petroleum's No. 1, in the Milk River area was geologically much deeper. A number of oil and gas shows were met in the deeper drilling, but no commercial production.

**British Columbia Test**

In the Kelowna district, British Columbia, Okanagan Oil & Gas Co.'s No. 1, Section 2-26-Osoyoos, is temporarily shut down at 2,265 feet, hard limestone drilling making necessary some repairs to the drill stem.

**Manitou Gas Test**

In the Manitou district, southwestern Manitoba, Commonwealth Petroleum's No. 2, LSD 2, Section 26-2-9wPM, is reported drilling below 1,200 feet.

**Canadian Petroleum Output**

Official figures of the petroleum output for all Canada for the month of October, 1931, show a total of 99,924 bbls., as against 101,435 bbls. in September, and 167,466 bbls. in October, 1930. Of the Canadian production, Alberta fields accounted for 89.1 per cent, Ontario for 10.4 per cent and Brunswick for 0.5 per cent. The output from Alberta wells included 80,600 bbls. of crude naptha and 2,643 bbls. of light crude from Turner Valley; 4,413 bbls. of light crude from Red Coulee; 989 bbls. of heavy crude from Ribstone and 407 bbls. of heavy crude from Wainwright. For the first 10 months of 1931 the aggregate production from all Canadian fields was 1,378,407 bbls., or 16.6 per cent more than for the same period of 1930.

**Ontario Drilling**

In southwestern Ontario, Vacuum Gas & Oil Co. of Toronto is reported arranging for further development of natural gas acreage in Norfolk County near Maybee's Corners. The company owns one producing gas well in this area and a half interest with Acme Gas & Oil Co. of Toronto in another well, production being taken by Dominion Natural Gas Co.

**Pelee Island Test**

In the Ontario fields, the Pelee Oil & Gas Co., Ltd., has been organized to drill for oil on Pelee Island, in Lake Erie, south of Essex County. The officers include: President, Edward Winter, Leamington; first vice president, Hugh A. Snyder, Windsor; second vice president, Albert Strait, Leamington; secretary, Orville Rolfson, Windsor; treasurer, Maj. Ralph Sheppard, Windsor; directors, J. F. Wilkin, Sandwich; and B. C. Watson, Leamington. The company was organized primarily by Leamington men, and is now making arrangements for active drilling operations.

Pelee Island is the southernmost point in Canada, and is off the Essex County shore line of Lake Erie where important gas fields were opened in the years following 1889. Some shallow oil was also found on the mainland, and a deep test at Leamington many years ago disclosed a show of 42 gravity crude in the Trenton limestone. Some drilling was later done on Pelee Island, and it is stated that nine wells showed oil and one showed gas. For a time commercial oil shipments were made, but owing to declining production and transportation difficulties the wells were abandoned and plugged. The Pelee Oil & Gas Co. has 2,000 acres under lease and will possibly clean out and deepen the old wells in addition to doing some new drilling.

## EASTERN FIELDS

(Continued from Page 47)

farm in Grant district. It is down 600 feet. In Clay district the test of Charles Spriggs on the W. L. Smith farm is standing at 2,490 feet. In Mason County the Berea Gas & Oil Co. has a test due in on the Jackson Coal & Mining Co. tract in Waggoner district. This is shallow drilling in the Cow Run sands. In Wirt County the Heck Oil Co. is still waiting on water to resume drilling on the J. E. Watkins farm in Reedy district.

In Gilmer County the Pittsburgh and West Virginia Gas Co. has started a test on the Ida Black farm, its No. 7,571, in DeKalb district. It is drilling at 570 feet. In the same district A. E. Ellis and others have a rig standing on the Alice Ayers farm. In Center district, Fletcher Stout farm, McCall & Co. have spudded in and started drilling No. 5. In Troy district the Carnegia Natural Gas Co. is down 1,800 feet in its No. 1,479 on the A. C. Law farm.

**Deepest Test in East**

The deep test of the United Fuel Gas Co. in Curtis district, Roane County, and on the J. W. Hinzman farm, is now drilling at 8,680 feet, the most extreme depth of an eastern well. Another test, that of S. W. Meals and others on the George S. Davidson farm in Monongalia County, Morgan district, is drilling at 1,765 feet and has reached an interesting depth for a wildcat in that section. In Battelle district, the West Penn Gas Corp. has its test on the Kimble Wood farm 2,150 feet deep. In Grant district, Cabell County, the Larner Gas Co. has abandoned its rig and location on the James Connor farm.

**SOUTHWEST PENNSYLVANIA**

In addition to the two gas wells in Washington County, there were two oil wells completed, both small but in long-lived sands. In Pine Township, Allegheny County, a local syndicate completed a test on the R. Kennedy farm at a depth of 1,695 feet and in the 100-foot sand. It is showing for about a 3-bbl. pumper initial. In South Beaver Township, in Beaver County, J. L. Abrams and others drilled a third well on the Caroline Young farm. It is also a 100-foot sand well and is rated good for about a barrel a day. In McCandless Township, E. A. Bream & Co.'s No. 6 on the Wallace heirs farm, Allegheny County, which was reported as a light pumper, now has the appearance of about a 5-bbl. producer.

In Hanover Township, Beaver County, C. T. Andrews has started No. 6 on the Tom Whitehill farm and is pushing the well to completion. Work in Greene County is about through for the present with the low prices of crude prevailing. About the only well drilling is the test of the Philadelphia Oil Co. on the Olive B. Stevens farm in Whitely Township.

## W. E. OLMSTEAD DIES

W. E. Olmstead, aged 72, veteran oil man and mining engineer of San Antonio, died in Mexico City, December 12, and the body was brought to San Antonio for burial. Mr. Olmstead had gone to Mexico to look after some mines. He drilled wells in the Nacogdoches County Pool in East Texas and also in northwestern Louisiana. For several years he has lived in San Antonio and was vice president and general manager of the Golden West Oil Co. which has production in the Joe Bruner Field, the old Luling Field, and in Medina County and elsewhere.

## WILLIAM EADY DIES

CHATHAM, Ontario, Dec. 26.—William John Eady, formerly a well known Petrolia oil operator, died recently at Sarnia, in his 63rd year. He at one time owned an oil property at Marthaville and later was employed by Canadian Oil Companies, Ltd., at Petrolia and Imperial Oil, Ltd., at Sarnia.

# Suggested Principles for Well Spacing

## Mathematical Formulas Applied to Drainage Areas and Ultimate Oil Production. Definite and Uniform Pattern

By W. P. Haseman

A tract in an oil pool has a spacing pattern of 64 wells to each 640 acres, with a drainage area of 10 acres per well. This tract presents two problems to the operators, namely, (1) How many barrels of oil shall be produced per day from the tract, and (2) how shall the wells be produced.

The first problem is one in simple arithmetic and requires little or no original thought. It involves in general two things, the ability of the wells to produce oil and the ability of the producers to efficiently and effectively handle the production. The ability of the wells, on an average, to produce is known to be 6,000 bbls. per 24 hours, or a total of 64 times 6,000, which gives 384,000 bbls., per 24 hours. The ability to handle the production is known to be limited to 6,400 bbls. per 24 hours. Each well is therefore allotted 100 bbls. per day and each and every operator takes ratably and equitably from the common underground supply of oil and gas.

So far, very well; no operator is hurt and no operator receives any special favors. However, one operator, Mr. A, produces his allotted production by flowing his wells wide open for a short period and then closes the wells. Another operator, Mr. B, produces his allotted production by flowing his wells at the rate of 3,000 bbls. per 24 hours for a given period and then closes the wells. A third operator, Mr. C, produces his allotted production by flowing his wells at the rate of 100 bbls. per 24 hours for the continuous period of 24 hours. In general, no operator flows his wells simultaneously. The rate of flow on a 24-hour basis of time is the same for all operators and all wells, but the method of producing oil from the common underground supply is markedly different among the operators and wells.

### Principles of Drainage

How the oil is to be produced through the wells from the underground supply is as important if not more so than how many barrels per day shall be produced. In fact, the method of producing the wells affects both the economic and the ultimate yield of oil from the tract and from the pool. It is the purpose of this paper to outline the principles of drainage and to formulate more definitely the basic method of producing oil through wells from a common underground supply.

The production of oil from a porous rock reservoir into and out of a drilled well is accompanied by certain altered conditions of the fluids within the reservoir surrounding the well. Among these changed conditions are:

1. The directed flow of oil and gas through the rock reservoir.
2. The removal of oil and gas from the rock reservoir into a well.
3. The lowering of the fluid pressure within the rock reservoir.
4. The altering of the state of the fluids within the reservoir whereby gas is released from solution in the oil, gas and energy are partially dissociated from the oil and the viscosity of the oil is increased.
5. The changing positions of portions of oil and gas, and the avenues of dissipation of energy in the rock reservoir.

These changed conditions as set up in the rock reservoir from the directed flow to and out of a given well act and serve as an effective barrier to an offset well setting up and extending its directed flow. Each of two adjacent and similarly and simultaneously producing wells sets up its directed flow with changed fluid conditions which extend out and encroach upon each other but are limited and defined by a vertical plane midway between the wells. The fluids flow away from both sides of the plane toward the respective wells. Thus a drainage area or volume for a producing well is limited and defined.

A number of wells uniformly spaced to a given tract will set up a definite and uniform drainage pattern in the rock reservoir when all wells are similarly and simultaneously produced. The case where only one well near the center of the tract produces oil the directed flow with changed fluid conditions extends out from the single producing well into and throughout the rock reservoir. The distance at any given time after the well begins to produce oil and gas to which the changed conditions extend from the well and the magnitude of the changed conditions depend upon (1) the time and rate of producing, (2) the quantities of oil and gas produced, and (3) the character of the reservoir fluids and rock.

### Drainage Area

It is well known that two wells drilled to each 160-acre tract in an oil pool and so spaced as to set up a drainage area of 80 acres per well will produce more oil from the tract than will a spacing of wells with a drainage area of 160 acres per well. In fact the smaller the drainage area per well the greater the ultimate production from a given tract. This fact is unmistakably and unquestionably verified by field data published in Reports of Investigations, Serial No. 2,270, August, 1921, U. S. Bureau of Mines, and in various articles in trade journals. One record from the Bureau of Mines report is given below as typical and representative of the relation between drainage area and ultimate production of oil from a tract.

TABLE 1

| Drainage area in acres per well— | Acreage yield |
|---|---|
| 15 | 987 |
| 10 | 1,420 |
| 7 | 2,000 |
| 5 | 2,260 |
| 3 | 3,250 |

These data are represented graphically on Chart 1. It is assumed in the interpretation of these data that within reasonable limits the wells of the tracts were drilled simultaneously and produced similarly and simultaneously throughout the most active part of their lives. The chart indicates that the greatest ultimate acreage yield from the rock reservoir underlying the above tracts through wells without the introduction of external energy would be around 5,000 bbls. per acre with the drainage area approaching zero acres with a drainage area of 80 acres per well.

Tables 1 and 2 and Chart 1 support the data developed by Haseman from a theoretical consideration of the relation of drainage area and ultimate yield of oil in a well spacing formula. Chart 2 graphically represents the per cent increase in yield of oil as computed by the formula for a given tract by halving the drainage area. In this computation the sand quality of the reservoir rock is assumed to be approximately 17.5 per cent yield with a drainage area of 10 acres per well. These computed data indicate that the sand quality of the reservoir rock as represented by the data in Table 2 is less than 17.5 per cent yield with a drainage area of 10 acres per well.

### How Oil Should Be Produced

These data have a direct application to any and all tracts in any producing oil pool and are significant in the determination of how the oil should be produced through wells from the common underground supply of oil. In the application of these data to the problem presented in the introduction to this paper take the case where the operators produce the 64 wells in such a manner that on an average 16 widely distributed wells are continuously and simultaneously producing oil from the 640 acres. The oil is produced from the underground supply with a working drainage area of 40 acres per well. Each operator takes ratably and equitably from the underground supply with a working drainage area of 40 acres per well and fails to produce as much ultimate oil as could be produced in case all wells were produced simultaneously with a drainage area of 10 acres per well. Each operator makes the investment and sets up the mechanism to produce the oil from the underground supply with a drainage area of 10 acres per well, but actually produce it with a drainage area of 40 acres per well. The result is an underground loss of 171 per cent, and therefore each operator produces about four-tenths as much oil as he could and would produce by the simultaneous production of all wells.

In conclusion, oil should be produced from a given tract or pool through wells in such a manner that each well in a given spacing pattern will (1) establish and maintain the smallest possible drain-

(Continued on Page 87)

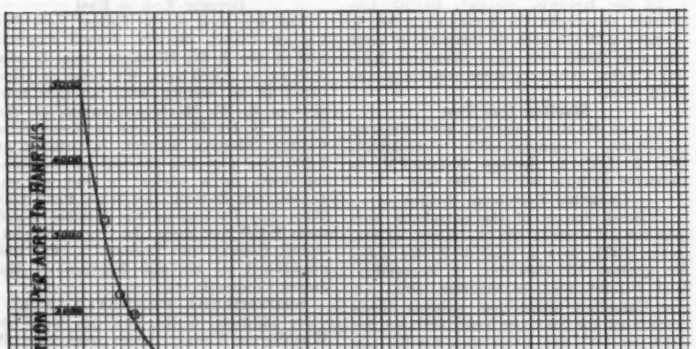


Chart 1.

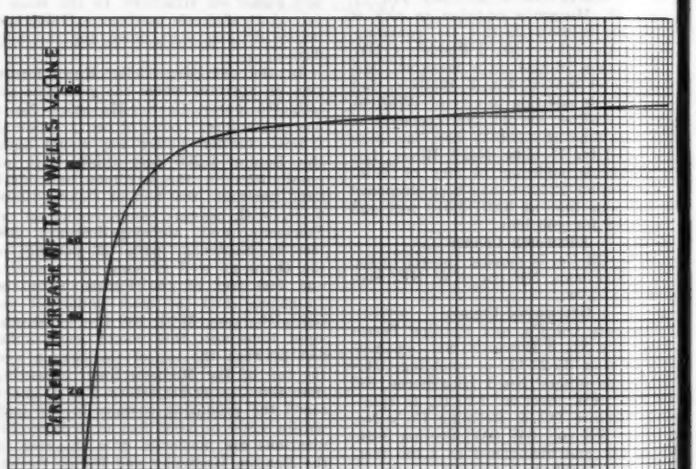


Chart 2.

TABLE 2

| Drainage area in acres per well— | Acreage yield | Per cent increase |
|---|---|---|
| 80 | 218 | ... |
| 40 | 425 | 95.0 |
| 20 | 810 | 90.6 |
| 10 | 1,460 | 81.2 |
| 5 | 2,340 | 60.2 |
| 2.5 | 3,300 | 41.4 |
| 1.25 | 4,000 | 21.3 |

The third column in Table 2 gives the increased per cent in yield per acre of oil from the given tract by halving the drainage area per well and the wells being produced similarly and simultaneously. For example, a tract having a spacing of wells with a drainage area of 10 acres per well will yield 81 per cent more oil than with a drainage area of 20 acres per well; 171 per cent more than with a drainage area of 40 acres per well; and 266 per cent more than

# Holiday Quiet in East Coast Markets

## Year Closes With Fuel and Diesel Oil Prices at All-Time Lows. Continued Curtailment in First Quarter Looked for at Refineries

By A. E. Mockler

*New York Bureau, The Oil and Gas Journal, Rooms 1919-21, No. 154 Nassau Street*

NEW YORK, Dec. 28.—Holiday quiet was much in evidence throughout East Coast refined products markets during the week. With Christmas falling on Friday most of the large oil companies closed up for the week-end on Thursday afternoon. This holiday feeling, coupled with the fact that refined products buyers are holding down stocks to a minimum for purposes of inventory taking, made for practically a dormant market in most branches of the trade, with tank wagon kerosene and gasoline deliveries and spot deliveries of bunker oils, accounting for practically all of the week's activity.

Refiners have booked contract business on bunker "C" oil for 1932, with a top price of 95 cents per barrel, refinery, for the year, and $1.10 per barrel maximum for 1933 deliveries, a number of contracts having been booked to run through that year. In the Diesel oil market, 1932 contracts have been written at a top of $1.65 per barrel, with $1.80 top on contracts running through 1933. While these "top" prices in such contracts mean but very little, under present market conditions, the spread between refiners' views as to a fair top for 1932 and 1933 on these heavy oils indicate that leading companies hold to the belief that 1932 will witness an upturn in spot oil values that will carry on into the following year.

Present prices for bunker "C" oil and Diesel oil at Atlantic Coast ports, 60 cents per barrel and $1.30, respectively, are the lowest in the recorded history of the industry. The present market on bunker oil is 45 cents per barrel under the quotation in effect at the start of the year, while the current Diesel oil quotation is 55 cents lower than the price ruling on January 1. While opinion in trade circles appears to be that the market for these oils is now bottom and that the next price adjustment will be upward, the market apparently has lost some of the buoyancy evident a month or so ago, when predictions were freely made in some market circles that fuel and Diesel oil prices would close the year at higher levels than those now prevailing.

The principal basis for optimism in heavy oil markets, as in the case of the lighter products, is that effective measures will be devised for holding the gains which the industry has already made in the direction of crude curtailment, while an international accord for the making of present conservation measures world-wide in scope is also seen as a possibility. Another important factor in the market situation is the projected plans of leading refiners for continued drastic curtailment in refinery operations during the first quarter of 1932. It is felt in some quarters that East Coast refineries will go even under present throughput totals in their effort to put the refined products market in a more stable condition and to lighten the load of surplus stocks of products which the industry is carrying.

### Refinery Gasoline

The refinery market has shown further weakness and it is evident that unless demand should show a radical improvement within the next fortnight that present prices cannot hold. In some quarters, it is expected the market will lose the half-cent gain attained a few weeks ago, and it is possible this change may come before the close of the year.

Leading refiners posted 6½ cents per gallon for U. S. Motor gasoline of 65 octane number and above, in tank car lots at refinery terminals, but the market is not firm at this level and 6 to 6¼ cents has been freely done in some quarters. On gasoline testing under 65 octane number, 5¾ cents is the current going level, with some intimations that 5½ cents could be worked in limited quantities.

Curtailed trading has been reported in all grades of gasoline in the refinery market, with jobbers holding down storage stocks in anticipation of an early cut in posted schedules.

While market sentiment has improved as a result of the curtailment in output of Texas crude, the failure of the Group 3 gasoline market to hold recent gains is causing concern to eastern refiners and marketers, indicating as it does the probability of offering of gasoline out of the Gulf for tanker shipment to domestic North Atlantic ports at lower prices.

U. S. Motor gasoline, 65 octane number or better, is offered for shipment from the Gulf at 5 cents per gallon, which figures out approximately 5⅜ cents per gallon laid down at New York. This price, of course, applies to cargo lots, and with an indicated market of 6 cents for this grade of motor fuel here, there is little margin for handlers at this level.

California gasoline prices on motor fuel for shipment East have been out of line with the local and Gulf Coast markets for the past few weeks, and no business of any consequence has been reported closed.

### Tank Wagon Gasoline

An easier undertone is in evidence in the market, in sympathy with the softer refinery situation, and with price cutting in retail markets spreading as the wholesale market eases off, further cuts in tank wagon and service station prices appear inevitable.

Effective December 22, Standard Oil Co. of New York and other marketers reduced tank wagon and service station prices for gasoline 1 cent per gallon at Buffalo and Rochester and the surrounding area. The present policy of major marketers appears to be to meet local competition as it develops, rather than to make sweeping revisions affecting the entire territory.

Weather conditions have made for a well sustained demand for gasoline throughout the week, with both the regular and premium grades moving out in good volume. Refiners are apprehensive, however, regarding a sharp drop in consumption with the turn of the year.

The recent 2-cent cut in gasoline prices in metropolitan New York has not entirely eliminated price cutting, and the market is still considerably unsettled, with leading marketers meeting local competition as it develops.

### Kerosene

In contrast to gasoline, the refinery kerosene market remains in strong position, with continued heavy gallonage reported. Refiners are quoting 41-43 water white in tank car lots at 6 cents per gallon, and the market is firm at that level, with a steady movement into consuming channels.

Intensified competition in kerosene marketing in the Buffalo and Rochester areas, which have likewise been a hotbed of gasoline competition during the past fortnight, brought about a cut of 1½ cents in tank wagon kerosene prices during the week, Socony initiating the advance and other marketers following suit. This was the first change in tank wagon kerosene in this territory for a considerable period.

### Furnace Oil

Refinery movement of domestic heating oil has shown further gains, and the market is in steady position. The tank car market is quoted at 3½ cents for furnace oil, minimum 32 gravity, and jobbers were back in the market for considerable replacement stocks.

Retail furnace oil markets were also showing a better tone, with gallonage running considerably ahead of that of previous years. Spot 36-40 furnace oil is quoted at 7¾ to 8 cents, with 32-36 oil at 6½ cents and 28-32 oil at the same level. Considerable oil from California and the Gulf Coast has been moved into East Coast area for delivery on furnace oil contracts this year.

Low prices and favorable time payment terms on oil burner sales have materially increased the number of new installations this year, and has likewise tended to substantially extend the sales season of the burner manufacturers. The number of new domestic oil burners installed in East Coast territory this year has established new high records on the part of many manufacturers, and this is naturally being reflected in furnace oil gallonage handled by refiners and marketers.

### Lubs

There were no further changes in the lubricating oil situation, and prices remained unchanged at the reduced levels made effective at the start of the previous week. Spot business was practically at a standstill, reflecting the usual holiday quiet, and traders here are not looking for any revival in demand until after the turn of the year. Buyers' stocks of cylinder oils are believed to be extremely light, however, and refiners look for a sharp upturn in demand early in January. In the interim the market continues rather soft in some quarters, and it is expected some business will be closed during the coming week for shipment after the turn of the year.

Red and pale oils were likewise sluggish, and tank car movement was at extremely low levels. Industrial consumers were not ordering forward shipments on contract, preferring to defer taking in additional supplies until after they have completed their year-end inventories. There were no price changes reported in this group.

### Fuel Oil

Refiners reported a dull market on the spot position, and the posted price of 60 cents per barrel, in bulk, f.o.b. refinery terminals, remained unaltered. While all of the large contract business for 1932 has been lined up, refiners are still rounding up the scattered ends of their contract business for the coming year.

Fuel oil stocks continue heavy, and unless drastic downward revisions in refinery operations and heavy oil production are put into effect during the first quarter of 1932, little improvement in the fuel oil market, from the price standpoint, appears likely. Refiners are dissatisfied with the present return on their heavy oil sales, but with domestic production holding up fairly well and Rumanian competition still stiff at many European ports where this product comes into competition with American oil, the problem of getting a more substantial return on bunker "C" oil sales remains unsolved.

### Diesel Oil

As was the case with the remainder of the refined products market, Diesel oil underwent no important changes in East Coast refinery circles, and the posted price held unaltered at $1.30 per barrel, bulk, at terminals.

Although contract deliveries to the marine industry held up at normal levels, there was some falling off in spot demand. Offerings of Diesel oil for shipment from California and the Gulf to Atlantic Coast ports are still being made at low prices, and this situation would appear to militate against any early upturn in eastern prices.

### Gas Oil

Growing use of heavy fuel oil in place of gas oil in manufacturing operations of gas companies in this territory is indicated by contracts covering 1932 requirements of the utility companies. The contract booked by Gulf last week for supplying Public Service Corp. of New Jersey with 60,000,000 gallons of gas oil, on later reports, turns out to have involved fuel oil instead. Public Service has pioneered in the use of fuel oil in place of gas oil, and numerous other utility companies in the East are following this lead.

The spot gas oil market remained quiet and the undertone was still easy. The posted price for 28 gravity, plus, gas oil was unchanged at 4 cents, but 3¾ cents still represented the actual market for tank car shipments and leading refiners were meeting this quotation in their spot sales. There was considerable activity in the market during the week, refiners' sales departments rounding up the odds and ends of their contract business for 1932.

### Paraffin Wax

There was some export inquiry in the market, and while actual details surrounding export orders were lacking, it was reported that a fair volume had been closed for shipment immediately after the turn of the year. Refiners with large stocks on hand were quoting attractive prices on some melting points for prompt shipment, but although the spot market was rather soft in tone, no further recessions in posted prices developed.

Domestic consuming manufacturers were not in the market for stocks in any quantity, and traders expect the domestic situation to remain practically dormant until well into January, pending the completion of annual inventories by consumers.

### Export Market

No cargo sales of either gasoline or kerosene were reported out of the Gulf, and quotations remained unchanged. Buyers were bidding 4½ cents for 64-66 gasoline, and failing to locate offerings at this figure at the United States Gulf were turning to Rumania, where it was reported possible to buy a comparable grade at this price f.o.b. Constanza. The kerosene market continued tight at the Gulf, with prices strongly held and additional business looked for after the end of the year.

Considerable interest was shown in Mexican and Venezuelan crudes on the part of European buyers, and further contract business for 1932 was reported closed at prices quoted in last week's report.

Foreign buyers are watching the domestic gasoline situation with close interest, and a continuance of the present weak market at Mid-Continent refining points is expected to bring about a lowering of export prices at the Gulf. While Rumania is undoubtedly getting considerable gasoline business that would normally be placed at the Gulf, it is believed a number of buyers who would normally be in the market at this time are holding off and allowing their reserve supplies to become depleted, pending a more favor-

(Continued on Page 87)

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## ROCKY MOUNTAIN AREA

(Continued from Page 46)

feet and straightreaming to lower the 10-inch to bottom for a formation shut-off and to straighten a crooked hole.

**Routt County**

Mid-Colorado Petroleum Co.'s No. 1 Ombolt, NE cor. SE Section 29-4n-87, Fish Creek, is drilling at 1,628 feet. The Sundance originally was estimated at around 2,000 feet.

**Larimer County**

Mayer Oil Co.'s No. 1 Reed, SW cor. NW Section 28-4n-69, Berthoud Dome, is underreaming the 6⅝-inch at 2,110 feet. Colorado Producers, Inc.'s No. 1 Hogsett, NW NE Section 21-4-69, is rigging machine for a shallow test following the acquisition of an interest in the tract by Henry Dickerson.

**Moffat County**

Ohio Oil Co.'s No. 1 Bogenschultz, C SE SE Section 9-6n-91, Craig Dome, is ready to spud. This is a rotary test primarily for gas. The first objective is a gas sand in the Wasatch expected at 2,700 to 3,000 feet. The Morapas sandstone is logged at 4,000 feet.

**Morgan County**

Indian Territory Illuminating Oil Co.'s No. 1 State, C NE NE Section 16-1n-57, is drilling ahead. It is making hole at 5,855 feet after cementing back from 5,920 feet to 5,596 feet, total depth.

### WYOMING

**Washakie County**

Ohio Oil Co.'s No. 1 Strothers, SW SE NW Section 19-45-92, Neiber Dome, which at a total depth of 8,596 feet held the record for depth drilled with rotary tools in the Rocky Mountain area, made a bailing test of the second Frontier at 7,475 feet after plugging back only to find the sand showing water. It is believed the water is coming from behind the 5⅞-inch liner and this string is being recemented. It will be several days before results are known. The sand showed 10 feet of saturation at 7,465-75 feet in cores taken on the way down.

**Converse County**

John Ackard's No. 1 Morton, SE Section 24-33-72, southeast of Douglas, is drilling at 1,800 feet. The last several hundred feet were in a sticky gumbo-like shale, but the formation again has hardened up and progress is slow.

**Fremont County**

Ward Oil & Gas Co.'s No. 2, NW cor. Section 27-34-90, Dutton Basin, is skidding rig from No. 1, 300 feet to the west, which was abandoned at 2,530 feet in the Frontier after encountering several good shows of oil and gas.

**Weston County**

The Osage Field is the most active operation in Wyoming at this time. Two new operations were reported in the Jones-Rose Syndicate's No. 1, NW SW NE Section 21-46-63, which is spudding, and West Osage Oil Co.'s No. 2, SE cor. NE Section 15-46-64, which is setting the 10-inch at 500 feet. The last named is a north offset to Federal Oil Co.'s No. 1, which came in several weeks ago flowing 600 bbls. per day. It is still flowing 400 bbls. a day and, considering its comparatively shallow depth, is proving to be one of the most prolific producers drilled in the new district to the west of Beaver Creek.

Chadron-Osage Oil Co.'s No. 15, NW cor. SW Section 14-46-64, an east offset to the Federal well, is setting 6⅝-inch on top of the sand and getting ready to drill in. This company has been successful in bringing in new production in the Osage district and has some plans under way for the further expansion of its operations. E. B. Jones, of this company, says negotiations are under way preparatory to erecting a modern 1,000-bbl. refinery and marketing facilities to handle the output.

Tug Oil Co.'s No. 1, NW cor. SW Section 15-46-64, is drilling at 200 feet.

Julius Peters and others' No. 1 Witzell, SE cor. NW Section 30-46-64, Fiddler Creek, is bottomed at 3,400 feet and repairing rig and boiler to go another 1,000 feet.

### MONTANA

**Carbon County**

An important extension of the Dry Creek Dome in Carbon County, southern Montana, north of the Elk Basin Field, appears to have taken place in Carbon Oil & Gas Co.'s No. 1 Armstrong, SW cor. NW Section 7-7s-22. A report direct from the field says that the well shot oil over the top of the derrick and covered the ground around the well for some distance after cleaning itself of 300 feet of drilling mud. It was immediately shut in and no test was made. While no estimate has been made by anyone connected with the company, one oil man said it looked as if it might make 3,000 bbls. of oil and 8,000,000 feet of gas. That, however, is merely a guess as the well did not perform long enough to give any reliable indication of its capacity.

The depth at which the oil was found, or the horizon, was not given, but drilling had just been resumed after cementing 8⅝-inch at 5,710 feet, presumably on top of the Lakota sand. The hole, which is being drilled with a rotary, went through 8 feet of saturated sand in the Dakota topped at 5,601 feet, but no test was made. The Dakota also showed some gas. The Muddy sand also showed some oil and cores from the Frontier sands showed gas. The oil is very high grade of paraffin base. Officials say it looks like a very good well, but they made no estimates. Tanks are being erected and when these are up, it will be opened and gauged.

This well is about 1½ miles east and just a little north of the Ohio Oil Co.'s No. 2 Northern Pacific, NE NW SE Section 11-7s-21, the discovery well which came in in October, 1930, at 5,452 feet in the Lakota sand. On a 16-hour test the well flowed at the rate of 2,300 bbls. per day. The oil tested 52 degrees gravity and is exceptionally high in gasoline content. Prior to this discovery the Ohio company had proved the Frontier sand for gas. The oil from the discovery well is being shipped to the Utah Oil Refining Co. at Salt Lake City. Last spring the well was deepened 6 feet to a total depth of 5,516 feet and responded with an increase from 600 to 1,200 bbls. daily. It gradually declined until a week later it was making 800 bbls. Several wells subsequently drilled by the Ohio company failed to equal the discovery and the bringing in of No. 1 Armstrong indicates these may have been close to the western edge.

No. 1 Armstrong was started last March by J. D. Cook, Mark U. Weber, and associates. Charles E. Orchard, one of the principal operators in Oregon Basin, furnished the rotary rig for an interest. Last September Harry P. Hynds, of Cheyenne, acquired a controlling interest and was elected president of the Carbon Oil & Gas Co., which was formed to take over the property.

Ohio Oil Co.'s No. 1 Chapman, C SW SW Section 2-7s-21, Dry Creek Dome, to the north of the producing wells, was drilled to a total depth of 6,219 feet and stopped in the top of the red beds, testing all horizons to and through the Sundance. The last had nothing of value in it. The hole is being plugged back to 5,600 feet to test the Dakota from which saturated cores were taken on the way down. The Lakota carried water.

Ohio Oil Co.'s No. 1 Kuchinski, NW SE NE Section 15-7s-22, Golden Dome, is completing water well. The 15½-inch was cemented at 335 feet.

**Liberty County**

Western Natural Gas Co.'s No. 1 Hicks, C NW NE Section 26-37-42, Whitlash district, which swabbed 45 bbls. in less than 24 hours from a sand in the base of the Colorado at 1,631-65 feet, indicating the opening of a new pool, may not be drilled down to the Sunburst as contemplated last week. The 8¼-inch was being underreamed to set on top of the sand when the string parted. The operators do not want to chance the loss of the hole with a fishing job. The casing is 180 feet off bottom and the swabbing test lacked that much of lowering the oil to bottom. Within 24 hours the oil again had risen 800 feet.

California Co.'s No. 1 Ross, NE SE NE Section 3-33-6e, Utopia district, is drilling at 840 feet after cementing the 15½-inch at 839 feet to shut off surface water.

**Cascade County**

Charles Merz and others' No. 1 Sheffelt, SE NW Section 4-21-4e, Black Horse Lake district, is drilling at 475 feet and is estimated to be 150 feet off the Sunburst sand. Buscher & Cassidy's No. 1 Johnson, NE cor. SE Section 19-22-3e, Benton Lake, had sulphur water in the Ellis sand at 1,280-90 feet, along with a show of black oil, and is setting 6¼-inch at 1,300 feet preliminary to going on down to the Madison.

**Teton County**

Earl Oil Corp., Ltd.'s No. 1 Gad, SE cor. NE Section 22-22-8w, Sun River district, is shut down at 3,720 feet with the bailer in the hole at 3,500 feet.

California Co.'s No. 1 Sullivan, NW NE NW Section 34-27-7w, Bynum district, is drilling at 2,805 feet in shale.

**Gallatin County**

Montana Gas & Petroleum Corp.'s No. 1 Adams, SE cor. Section 35-2n-1e, Three Forks district, is drilling at 632 feet with 12½-inch at 575 feet. It had a show of gas at 535 feet and another at 570 feet. This well starts in the Miocene Lake beds which rest directly on the granite.

**Glacier County**

Fulton Petroleum Co.'s No. 1 Black-

(Continued on Page 90)

## NATURAL GAS INDUSTRY PROBLEMS CONSIDERED

(Continued from Page 73)

presence of a liquid in the material influences only the coefficient in the equation for flow, and that the value of the change is proportional to the degree to which the voids of the material are filled by the liquid. Flow relations now are being studied at working pressures of 500 to 1,500 pounds per square inch over a wide range of sizes of resistance materials.

Oil recovery curves obtained from laboratory experiments and orifice flow curves obtained in the natural gas work are almost identical in type. This similarity is important because it indicates that the flow of air and gas through sands is in effect through a series of orifices, and not through a group of capillary tubes as has been suggested by some investigators.

**Solubility of Gas in Oil**

Based largely on experimental work with relatively dry gas and crude oils which has lost many of the lighter hydrocarbons, the general concept has been that solubility of natural gas in crude oil increases in direct proportion to the pressure at which gas is put into solution. Recently the bureau obtained solubility data on well head samples of oil-gas mixtures from high-pressure wells in the Oklahoma City, Kettleman Hills and Ventura Avenue Fields. Preliminary tests show that when gas is released from these oil-gas mixtures more gas is obtained than would be expected from a straight-line pressure-volume relationship. This finding is important in all production problems.

Another factor brought out by this study is the large percentage of shrinkage of a crude oil upon giving up its naturally absorbed gas. This may mean that when ultimate production of natural reservoirs is computed a shrinkage factor should be applied in addition to the depletion that can be measured in actual barrels of oil produced. The taking of oil-gas samples at the bottom of wells, together with measurements of the temperatures and pressures in the wells is the next step in solving this problem. A recording temperature and pressure instrument has been constructed and is being successfully operated. In the May 14 issue of The Oil and Gas Journal there was printed an article on this work prepared by Ben E. Lindsly of the Bartlesville, Okla., experimental station, entitled "Solubility of Natural Gas in Crude Oil."


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# Expect Improvement in Chicago Area

## Sellers Believe That Curtailed Operations and Better Demand Will Aid Market for Gasoline After First of Year

By Robert C. Conine
*Chicago Bureau, The Oil and Gas Journal, 6 North Michigan Ave.*

CHICAGO, Dec. 28. — With the approach of the new year marketers in Chicago district are looking forward to a sudden upturn in refined petroleum products business. Many buyers are holding off until their inventories are out of the way and the number of small lot rush orders in evidence shows that resellers are far from having excess material on their hands. The alacrity with which refiners respond to instructions, however, does not speak of as favorable a condition. One broker in Chicago at the close of last week ordered a car of gasoline out of an Oklahoma refinery for a Minneapolis buyer and the material reached its destination three days later, indicating both that the gasoline was waiting on the tracks and that freight loadings at this time of year have greatly simplified the work of the traffic department. One distributor said Monday that some of the refiners were giving car numbers practically on receipt of instructions.

### Weather Favorable

Splendid motoring weather has marked the Christmas holiday season. Looking over his files the weatherman has discovered that these warm, clear days in December have not been matched since 1875 in Chicago district. Automobile traffic has been unusually heavy, and the appearance of the principal arteries is reminiscent of the best summer days of peak gasoline consumption.

If unseasonable weather has boosted gasoline consumption, the effect has been quite the reverse on the fuel oil and gas oil business. Practically all of the gasoline moving is on contract basis and the fact that there is a considerable betterment in consumption has not been a sufficient factor in the face of excess stocks at refineries to help the open markets. However, while U. S. Motor and 400 endpoint gasoline tank car markets showed a further decline Monday, it is generally felt that constructive forces now at work will show results after the first of the new year. Most of the discussions in Chicago oil trade circles at this time, quite naturally, center on prospects in crude oil production. The proposal for Sunday shutdowns has been followed by proposed reduction of takings by pipe line carriers, reduced allowables in the East Texas area, and by projected curtailment in Oklahoma fields. Kansas and California curtailment activities are also cheering the oil men. These developments are imparting confidence in the strengthening of the crude oil markets after the first of the year.

### Refiners Hold Bulk of Stocks

Figures released for last week show a 1,110,000-bbl. increase in gasoline stocks, and while still considerably below figures for the same time last year, it is to be pointed out that the refiners are holding much more than their usual share of refined products due to the extreme reluctance of buyers to take out material as long as the markets continue to register weakness. Most of these refiners are able to hold their material and those that are not so fortunately situated, it is believed, are fast becoming less and less a factor in the open markets. Continued strength in the crude oil markets after the close of the year, according to most observers, will give the gasoline tank car markets the support that they require to invite buying activity. At the first signs of price betterment in these markets, it is believed, orders from distributors and jobbers who have allowed their stocks to remain at the lowest working level will begin to pour in.

Although the last survey made showed that refiners had not reduced their crude oil runs to stills, there are indications that in the future these runs will be curtailed to bring about a better balance between supply and demand. There have been a number of refinery shutdowns and it is to be noted that the majority of smaller operators are running at a much lower level than at the first of the month. Complaints have been heard from these refiners that buyers are not taking out large volumes of material sold. This source of worry extends to gas oils, which have been considered firm for some time, one small refiner saying Saturday that he has 800,000 gallons of gas oil sold and long over due on his hands.

In spite of the current low spot market quotations on all products with the exception of kerosenes and naphthas, the indications are that any further changes will be for the better and on this basis most of the buyers are planning to take a more active position next month. With few scattered exceptions the tank wagon markets have not been affected by softness in the tank car markets. The retail situation could be much worse, the few reductions noted being made in connection with the third grade material. It should also be remembered that the gasoline offered at below 3 cents is becoming more and more undesirable because of its poor antiknock quality, while gasoline of any appreciable antiknock rating sells for a half-cent to a cent higher than the material of no octane specifications.

### Gasoline Tank Car Prices

Lack of buying activity has made refiners anxious to move material under the markets with the result that prices have been pared down from day to day although offerings have long since departed from a profit basis. The price decline, however, has not been nearly so sharp as the pressure to sell might indicate. In the higher tests the gasoline tank car markets have remained steady and without signs of weakness. Some market students say that the end of "distress" gasoline is in sight, and that the first part of next month should find the relation of supply and demand favorable. In spite of numerous offers in 58-60 U. S. Motor of no octane specifications Monday, the price recession over last week was only an eighth of a cent. The same is true for the 60-62 400 endpoint gasoline. The U. S. Motor specifications material is offered today at 2½ to 2⅞ cents, and the 60-62 400 endpoint gasoline is quoted at 2¾ to 3⅛ cents. It is expected that when buying activity is resumed the latter material will show a considerable advance in popularity, as a number of distributors are tending to feature this gasoline. The higher test gasolines have been expected to suffer from competition with low priced stabilized natural gasolines, as it has been a practice in some quarters to market a mixture of 360 and 375 endpoint materials and 437 and higher endpoint motor fuels as a premium grade. However, the tank car prices on the 64-66 375 endpoint gasoline and the 68-70 360 endpoint material, give no indications of softening in these markets. The 64-66 375 endpoint remains at 3½ to 4 cents, and the 68-70 360 endpoint at 3⅞ to 4⅛ cents.

With continued current crude oil prices and firmness in the tank wagon and service station structure, it is generally felt that it is extremely unlikely that further declines will follow. In fact, most marketers agree that the gasoline tank car prices are now below the level which has been considered the minimum under current conditions. For this reason the conviction is strong that the first favorable turn in the markets will be a signal for an "orgy" of buying.

### Retail Situation

Developments following the 1-cent cut in the third grade gasoline service station price in Chicago district, indicate that the price cutting operators are not in a mood for price wars. In fact, a number of operators formerly featuring as undersellers are posting prices from half a cent to a cent higher than the blue competitive price motor fuel, while other trackage operators are half a cent below. This is quite different from prices during the summer which were often 4 cents below the normal third grade listing. However, the practice of giving away premiums with purchases of gasoline is becoming a serious nuisance to the marketers who rely on the quality of their gasoline and their service for business. It would not surprise anyone if the majors were to announce a considerable reduction in the price of the third grade motor fuel just any day now.

### Small Chain Operators

A check last week of business done by three to six station gasoline retail chains in Chicago and Milwaukee showed surprising results. One operator who owns six service stations had a total gallonage for the month of November of less than 20,000 gallons. Another operator, who features a blended gasoline, sold approximately 14,000 gallons during the month at his three Chicago stations. Business done by these stops was not enough to pay the overhead, and it is very likely that these cases are not unique. Obviously, there are some independent stations showing a profit. One Chicago operator, for instance, concentrates on one station and closely supervises it to maintain a high standard of service and courtesy. This one station, modestly housed, did a business in November equal to that chain of six stations above mentioned.

If marketers "turn over a new leaf" in the matter of marginal guarantees in their contracts, and the favorable reception of the 4.5 and 5.5-cent spreads with split above and below forms indicate this possibility, one of the worst sources of trouble the refiners have experienced this year will be a thing of the past and the spot market in 1932 should ride on a much evener keel. Experience dictates that optimism can be overdone in this connection, however, and it is not beyond the realm of possibility that a number of refiners will decide to take a chance, in view of other favorable circumstances and the efforts of more conscientious marketers, on the 6-cent and more marginal guarantees which have caused so much grief this year. Several refiners may forget that they were complaining earlier this year that the gasoline market debacles placed them in a position where they should be sending the buyer a check along with the tank cars of gasolines ordered out.

### Naphthas

Marketers handling naphthas have been busy lining up business for 1932. Business in these special cuts has become highly specialized and about 98 per cent of it is on a contract basis. For special reasons certain phases of the naphtha markets present complications not met in the gasoline markets. For instance, in some states the prices include motor fuel tax (which is later refunded), characteristic of certain naphthas, such as V.M.P. naphtha, differ in different states, and often paradoxes are presented, such as a 480 degree endpoint material commanding a higher price than some lower endpoint naphthas, because of special characteristics. A cleaners naphtha should have less than 2 per cent unsaturates, whereas one utilized as a rubber solvent is considered better the higher its percentage of unsaturates.

Premium grade naphthas from California crude oil bring prices approximating those of benzol, toluol and xylol, which they are meant to replace as solvents. These are fractionated to get various drying times and flashpoints. In the matter of varying specifications for V.M.P. naphtha, the endpoint for delivery in Standard of Indiana territory is 330 degrees; in the territory of Standard of Ohio the endpoint is 375 degrees, and for delivery in Standard of New Jersey territory the endpoint is 390 degrees. The initial in all cases is 200 degrees.

The downward pressure which has been exerted on cleaners naphtha, lacquer diluent, petroleum thinner, V.M.P. naphtha, and Stoddard solvent, for some time has apparently been released and these products, according to specialists in the business in Chicago district, are trending strongly upward except at scattered points where tank wagon competition continues as a threat.

### Naphtha Tank Car Prices

The tank car posting on cleaners naphtha in the territory has moved up a quarter of a cent to a range of 5½ to 6 cents, basis Group 3. The tank wagon price remains at 15.2 cents, Chicago. Lacquer diluent is quoted at 8½ cents at Mid-Continent refineries, and at 12 cents in the eastern markets, Bayonne. Rubber solvent, 100 initial and 300 endpoint, is quoted at 5½ to 6 cents, basis Group 3. Stoddard solvent, 58-60 degrees, 300 initial and 410 endpoint, is quoted at 4⅞ to 5⅛ cents, basis Group 3. The Chicago tank wagon price is 15.2 cents. Petroleum thinner, 290 to 300 initial and 415 endpoint, is up a quarter of a cent at 4¼ to 4⅜ cents, basis Group 3. The Chicago tank wagon price is 11.7 cents. The V.M.&P. solvent has taken on a steadier tone with an advance of a quarter of a cent making the present range 5¼ to 5½ cents.

The betterment in the naphtha markets at this time is attributed to a marked decline in the number of offerings made by refiners. The production of suitable solvent naphthas is analogous to that of production of high antiknock gasolines and is therefore less exposed to conditions which cause distress offerings. However, the markets are closely dependent upon industrial activity, which has been at a low ebb this year, while gasoline consumption this year set a new high level.

### Kerosene Tank Car Markets

Another bright spot in the refined products markets is the advances made in the kerosene tank car markets due to foreign buying. An eighth of a cent advance was registered this week. The 41-43 water white kerosene was quoted at 2⅜ to 2½ cents, and the 42-44 water white material was offered at 2½ to 2¾ cents.

### Fuel Oils and Gas Oils

With the exception of the 28-30 zero fuel oil, which advanced 5 cents a barrel, fuel oils were somewhat weaker this week and showed price declines. Industrial gas oil failed to respond to slight betterment in the zero grade and the distillates. A continuation of the present wave of mild weather will bring softness into these markets, it is feared. The heavier gravity fuel oils are reported to

be in a very unfavorable position. One marketer said Monday that he could buy 10,000,000 gallons of 18-22 fuel oil of suitable pourpoint at 20 cents a barrel. The position of prime white distillate is peculiar, distributors saying that they cannot buy below 1⅞ cents nor sell above 1⅞ cents.

Prices on fuel and gas oils the first of this week were: For 18-22 fuel oil, per barrel, 20 to 25 cents, representing a decline of 5 cents; 22-26 fuel oil, per barrel, 30 to 37½ cents, likewise a drop of 5 cents; 28-30 zero fuel oil, per barrel, 50 to 60 cents, an advance of 5 cents. The higher price 28-30 zero material offered by one major refiner is practically a gas oil of cherry color and 190 degree flashpoint. The 32-36 industrial gas oil remained unchanged at 1¼ to 1½ cents; 32-36 zero gas oil moved up an eighth of a cent at 1¾ to 1⅞ cents; 38-40 straw distillate advanced an eighth of a cent at 1⅞ to 2⅛ cents.

## HOLIDAY QUIET IN EAST COAST MARKETS

(Continued from Page 83)

able turn to the American export market.

Export volume in the New York market continues routine. A fair movement of cased gasoline and kerosene is reported to South American and other markets, but little buying interest in either of these products in bulk is reported locally. Lub oil business has been reflected by recent unsettlement in cylinder oil prices, but a stabilization of the lub oil market is looked for after New Year's, at which time export operators here look for an upturn in demand.

### Petroleum Exports

There was a pronounced falling off in shipments of refined petroleum products into export channels, declines being registered on all of the principal products.

The following table shows principal exports of refined petroleum products from the port of New York for the past three weeks (all figures in gallons unless otherwise noted):

| | Week ended | | |
|---|---|---|---|
| | Dec. 19 | Dec. 12 | Dec. 5 |
| Gasoline | 65,000 | 150,000 | 375,000 |
| Naphtha | 125,000 | 181,000 | 870,000 |
| Kerosene | 50,000 | 250,000 | 165,000 |
| Fuel oil | 5,000 | 9,000 | 13,000 |
| Lub oil | 525,000 | 1,737,000 | 766,000 |
| Pet., refined | 905,000 | 400,000 | 540,000 |
| | Pounds | | |
| Petrolatum | | | 3,000 |
| Paraffin wax | 1,500,000 | 6,660,000 | 2,235,000 |
| Refined | | 35,000 | 370,000 |
| Scale | 330,000 | 595,000 | 435,000 |
| Lub grease | 590,000 | 1,620,000 | 1,505,000 |

### Imports

Imports of crude and refined petroleum at the principal United States ports for the week ended December 19 totaled 987,000 bbls., a daily average of 141,000 bbls., compared with 1,737,000 bbls., a daily average of 248,143 bbls. for the previous week, and a daily average of 187,642 bbls. for the four weeks ended December 19. Details follow:

(Barrels of 42 gallons)

| | Bbls. |
|---|---|
| At Atlantic Coast Ports— | |
| Baltimore | 41,000 |
| Boston | 98,000 |
| New York | 455,000 |
| Philadelphia | 250,000 |
| Others | 143,000 |
| Total | 987,000 |
| Daily average | 141,000 |
| At Gulf Coast Ports— | |
| All ports | none |
| At Atlantic and Gulf Coast Ports— | |
| Total | 987,000 |
| Daily average | 141,000 |
| Daily average four weeks | 187,642 |

Distribution of total imports is as follows:

| | Bbls. |
|---|---|
| Crude | 628,000 |
| Gasoline | 74,000 |
| Gas oil | 59,000 |
| Fuel oil | 226,000 |

### California Oil Receipts

Receipts of California crude and refined petroleum at Atlantic and Gulf Coast ports for the week ended December 19 totaled 114,000 bbls., a daily average of 16,286 bbls., compared with 303,000 bbls., a daily average of 43,286 bbls. for the previous week, and a daily average of 40,929 bbls. for the four weeks ended December 19. Details follow:

(Barrels of 42 gallons)

| | Bbls. |
|---|---|
| At Atlantic Coast Ports— | |
| New York | 114,000 |
| Total | 114,000 |
| Daily average | 16,286 |
| At Gulf Coast Ports— | |
| All ports | none |
| At Atlantic and Gulf Coast Ports— | |
| Total | 114,000 |
| Daily average | 16,286 |
| Daily average four weeks | 40,929 |

All of the California oil receipts during the week were of gasoline.

Three cargoes of California refined products were reported cleared for Atlantic and Gulf Coast ports during the week, as follows:

For New York: 112,350 bbls. of gasoline on the Brilliant (Atlantic Refining Co.).

For Baltimore: 130,000 bbls. of gasoline on the Tamiahua (Richfield Oil Co.).

For New Orleans: 80,400 bbls. of gasoline on the Betterton (Associated Oil Co.).

### Charter Market

Continued quiet in the Gulf export market was indicated by fixtures in the tanker charter market, with much of the activity still centering in the Black Sea area.

Fixtures reported were as follows:

Motorship Ranja (Norwegian) 3,753 tons net, clean, Gulf to Havre and east coast U.K., 9/- one, 9/6, if two ports, January-February loading.

Steamer Mijdrecht (Dutch) 9,000 tons, clean, Black Sea to U.K./ Continent, 7/-, December loading.

Steamer Aase Maersk (Danish) 3,636 tons net, dirty, Black Sea to Hamburg, 7/3, January loading.

Steamer Singu (British) 4,437 tons net, clean, Black Sea to Shanghai, 19/-, January loading.

Steamer ——— (British) fuel oil, Venezuela and Aruba to Medway, 9/6. January loading.

Motorship Stigstad (Norwegian) 3,474 tons net, or Sommerstad, 3,318 tons net, clean, Black Sea to the Continent, 7/3, January loading.

Motorship Bello (Norwegian) 3,686 tons net, Black Sea to the Continent, clean, 7/3, January loading.

## SUGGESTED PRINCIPLES FOR WELL SPACING

(Continued from Page 82)

age area for the oil, gas and energy, and then (2) produce the maximum amount of oil. The first condition prescribed upon the well is most important and should be secured at all hazards by producing all wells simultaneously. The second condition is secured by regulating the rate of flow of the well such that the gas-oil ratio is or approaches a minimum.

## OKLAHOMA FIELDS

(Continued from Page 34)

ing at 2,960 feet. G. Orr and others' No. 1 Chucco, NW cor. SW NW Section 15-7-8, is a rig complete. Boettcher and others' No. 1 Walker, NE cor. Section 15-7-8, was drilling at 1,100 feet. Empire Oil & Refining Co.'s No. 2 Fish, SW cor. SE SE Section 19-7-8, was drilling at 2,500 feet. Same company's No. 1 Davis, NW cor. NE NE Section 30-7-8, was drilling at 1,500 feet.

Mid-Continent Petroleum Corp.'s No. 1 Farmer, SE cor. SW NW Section 2-6-4, Pottawatomie County, is shut down waiting for cement to set after landing casing at 4,156 feet. The total depth of the test is 4,255 feet. The top of the Simpson dolomite was found at 4,225 feet.

Carter Oil Co. and others' No. 1 Monette, SW cor. Section 35-7-4, south of the St. Louis Pool, in Pottawatomie County, was drilling at 4,050 feet. It found the top of the Sylvan shale at 4,035 feet.

### In Shallow Areas

The shallow districts in the eastern part of the State are active. Operations in Muskogee County include McDonald and others' No. 4 Durant, CNL NE NE, Section 16-14-18, which was spudding. It is located south of Muskogee Townsite. H. W. Guinan's No. 1 Lewis, NW cor. SE, Section 8-14-18, was drilling at 680 feet. North of the Muskogee Townsite, B. W. Christian's No. 1 Morrison, C SW NW, Section 15-15-17, was drilling at 1,170 feet. T. E. Wheeler's No. 1 A. Field, SE cor. NW SE NW, Section 18-15-18, found a showing of oil at 1,191-1,200 feet and another showing at 1,215-24 feet. It was drilling deeper at 1,300 feet. J. V. Dunbar's No. 1 A. Spaulding, NW cor. SE SW, Section 4-15-18, is the only active operation in the Jolly-D. L. T. Pool, and was drilling at 700 feet. On the west side of the county, R. B. Nash's No. 2 Grayson, SE cor. NW NW SE, Section 36-16-15, has spudded. Mack Drilling Co.'s No. 4 Peterson, SW cor. NW SW NW, Section 34-16-15, was drilling at 1,160 feet.

### Seminole Production

The production of the Greater Seminole area for the week ending December 26, was approximately 166,985 bbls. compared to 162,325 bbls. the previous week. The Seminole Field, which includes the 12 pools listed below, averaged 125,810 bbls.:

| Pool— | Bbls. |
|---|---|
| Little River | 20,725 |
| East Little River | 5,175 |
| Carr City | 12,625 |
| Maud | 1,860 |
| Mission | 9,460 |
| Bowlegs | 14,010 |
| Earlsboro | 16,300 |
| South Earlsboro | 2,315 |
| East Earlsboro | 16,030 |
| Seminole | 22,000 |
| East Seminole | 1,335 |
| Searight | 3,975 |
| Total | 125,810 |
| Allen | 10,025 |
| Asher | 665 |
| Wanette | 2,855 |
| Konawa | 5,495 |
| Sasakwa | 1,710 |
| St. Louis-Pearson | 20,425 |
| Total | 166,985 |

### Coal County

W. E. McCraw's No. 1 Shiring, NE cor. SE, Section 35-1-8, has been abandoned at 1,846 feet.

### Creek County

Gled Oil Co.'s No. 1 Hamilton, NE cor. Section 29-19-9, is drilling at 250 feet. O. M. Irelan has a machine on the location for No. 1 J. Tate, SE cor. SW, Section 34-18-10. Curtis Oil Co. made location for No. 1 George Barnett, SW cor. SE SE, Section 18-17-10. F. R. Billingslea and others made location for No. 2 Wayman "A", SE cor. NW NW, Section 22-15-8. J. A. Wise and others' No. 1 Harris, SW cor. NW NW, Section 16-14-8, is a machine. C. G. Tibbens has the rig up for No. 3 Bartlett, SE cor. SW NW, Section 18-14-9. Atlantic Oil Producing Co. and others staked location for No. 1 Copper, NW cor. SW, Section 26-14-10. Kirchner and others' No. 1 Strip, SE cor. NE, Section 13-19-8, has been completed for 50 bbls. in sand at 2,247-90 feet. Elson and others' No. 1-A Gage, SW cor. NW, Section 31-19-9, was shot with 25 quarts in sand at 2,525-87 feet and completed for 40 bbls. F. R. Billingslea and Riverland Oil Co.'s No. 2 Wayman "B", SW cor. NE NW, Section 22-15-8, has been completed for 170 bbls. in sand at 2,865-95 feet.

### Hughes County

Gypsy Oil Co.'s No. 2 McNevins, NE cor. SW, Section 5-8-9, has been completed for 9,000,000 feet of gas in Cromwell sand at 3,353-68 feet, total depth 3,372 feet.

### LeFlore County

Sooner Oil & Gas Co.'s No. 1 Bryson, NE cor. Section 30-6-26, is dry and abandoned at 1,750 feet.

### Love County

Charles Vanvleck and others' No. 1 Sheldon, NE cor. SE NW, Section 14-8s-2w, is dry and abandoned at 2,060 feet.

### Murray County

Capital Producing & Refining Co.'s No. 1 Cutchall, SE cor. NE, Section 6-1-2, has been abandoned at 2,432 feet.

### Oklahoma County

Phillips Petroleum Co. and Indian Territory Illuminating Oil Co.'s No. 1 Kry, NE cor. NW, Section 3-11-3w, Oklahoma City Pool, is a cellar. Phillips Petroleum Co. and Anderson & Prichard made location for No. 1 Roush, Lot 11, Block 8, South Hyland addition, CEL SW SE NE, Section 10-11-3w.

### Okmulgee County

D. M. Logan's No. 1 Wood, NW cor. SW NW, Section 32-15-13, has been completed for 6,000,000 feet of gas in sand at 1,925-30 feet.

### Pontotoc County

Radial Oil Co. staked location for No. 1 Brown, SE cor. NE NE, Section 28-5-6.

### Tulsa County

J. E. Martin & Cummings' No. 3 Bunger, SE cor. SW NW, Section 27-17-13, has been completed for 35 bbls. in sand at 1,981-2,013 feet.

### Wagoner County

J. E. Martin and others' No. 2 A. Drew, NW cor. SE, Section 26-18-15, is a machine. D. Clawson's No. 1 W. Porter, SW cor. NE NE, Section 7-15-17, is dry and abandoned at 1,052 feet.

## LOUIS H. BRENDEL IS TRANSFERRED TO BOSTON

Louis H. Brendel, advertising manager of Neilan Co., Los Angeles, Calif., manufacturers of regulating equipment, has

Louis H. Brendel

been transferred to Boston. The Mason Regulator Co. of Boston recently acquired the Neilan Co. and Mr. Brendel goes to direct the advertising for both these companies. Mr. Brendel has been with the Neilan Co. for the past four years during which time the sales of this organization have grown rapidly.

In his new capacity with the Mason Regulator Co., Mr. Brendel will have the greatly widened market of all process industries for all types of regulation and control equipment. His new duties in Boston begin January 1.

## MEXICAN REFINERY INVESTMENT

Figures of the last Mexican census, in 1930, just issued by the Department of Statistics, show that 19,786,000 pesos is invested in oil refineries, which in one year had an aggregate production valued at 12,478,000 pesos. Daily production capacity was 4,118,000 liters. Employes numbered 2,770 and received aggregate salaries of 3,630,000 pesos. Men's wages averaged 4.76 pesos a day and women's 1.80 pesos a day.

## GERMAN OIL OUTPUT UP

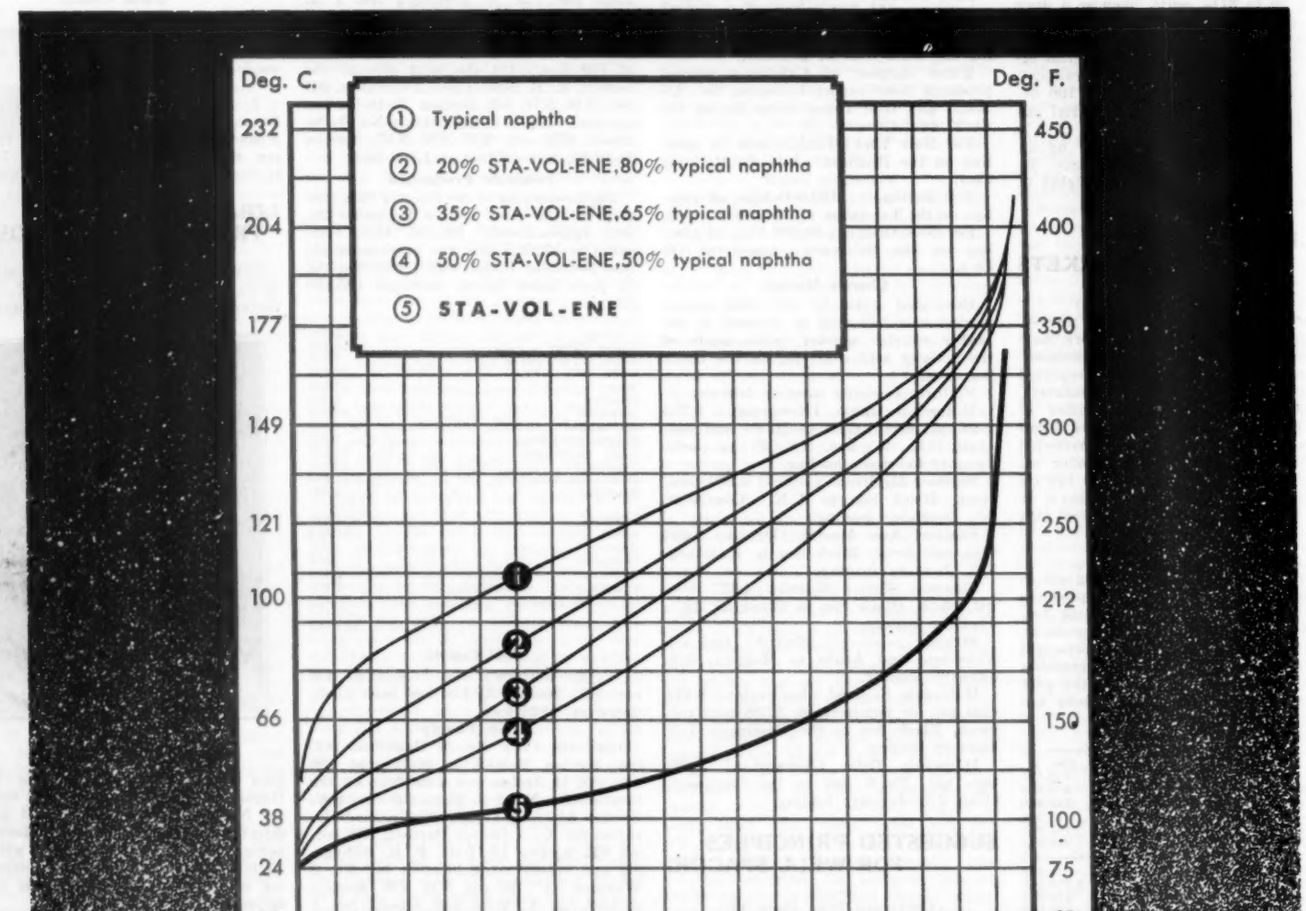
Last year, German oil production made a record at 160,000 tons but 1931 will register still higher. One of the largest producers estimates 240,000 tons for this and 300,000 for next year. In 1930, domestic production covered 6 per cent of gasoline consumption but the percentage for 1931 will probably be 12 per cent because consumption has not increased.

## JOHN HUNTER DIES

CHATHAM, Ontario, Dec. 26.—John Hunter, a pioneer of Canadian oil development, died at Petrolia recently, aged 84. He came to Oil Springs at the time of the first oil boom and later moved to Petrolia, being for some time connected with the J. & J. Kerr Co.

# STA-VOL-ENE

STABILITY VOLATILITY ENERGY




Sta-Vol-Ene is a highly fractionated natural gasoline for blending. Its use enables Refiners to cut deeper into the crude and blend back to Motor Fuel specifications. Sta-Vol-Ene, truly the "Cream of Petroleum," is available for cargo shipment to foreign or coastwise ports, and inquiries will be quoted either C. I. F. or F. O. B. our Goodhope, La., plant. (New Orleans port).

*The accompanying chart shows the boiling range of Sta-Vol-Ene and the effect of varying percentages of Sta-Vol-Ene blended with a typical Naphtha.*

## HANLON-BUCHANAN, INC.

GENERAL OFFICES – TULSA, OKLAHOMA

CABLE ADDRESS . . . STAVOLENE . . . TULSA, U. S. A.

# Manufacture of Natural Gasoline

## ORDER FOR SHIPMENT OF LIQUEFIED GASES

Following an investigation and recommendations by the Bureau of Explosives the Interstate Commerce Commission has issued an order covering the maximum permitted filling density in tank cars transporting liquefied petroleum gas of specific gravity shown, taken at 60° F. The order which was effective December 15 was made at the request of shippers.

The following table gives the specific gravity and filling density of the tank cars:

| Specific gravity | Filling density | Specific gravity | Filling density |
|---|---|---|---|
| 0.500 | 45.500 | 0.562 | 53.000 |
| 0.501 | 45.600 | 0.563 | 53.100 |
| 0.502 | 45.700 | 0.564 | 53.200 |
| 0.503 | 45.800 | 0.565 | 53.300 |
| 0.504 | 45.900 | 0.566 | 53.400 |
| 0.505 | 46.000 | 0.567 | 53.500 |
| 0.506 | 46.125 | 0.568 | 53.600 |
| 0.507 | 46.250 | 0.569 | 53.700 |
| 0.508 | 46.375 | 0.570 | 53.800 |
| 0.509 | 46.500 | 0.571 | 53.900 |
| 0.510 | 46.750 | 0.572 | 54.000 |
| 0.511 | 47.000 | 0.573 | 54.125 |
| 0.512 | 47.125 | 0.574 | 54.250 |
| 0.513 | 47.250 | 0.575 | 54.375 |
| 0.514 | 47.375 | 0.576 | 54.500 |
| 0.515 | 47.500 | 0.577 | 54.600 |
| 0.516 | 47.625 | 0.578 | 54.700 |
| 0.517 | 47.750 | 0.579 | 54.800 |
| 0.518 | 47.875 | 0.580 | 54.900 |
| 0.519 | 48.000 | 0.581 | 55.000 |
| 0.520 | 48.125 | 0.582 | 55.100 |
| 0.521 | 48.250 | 0.583 | 55.200 |
| 0.522 | 48.375 | 0.584 | 55.300 |
| 0.523 | 48.500 | 0.585 | 55.400 |
| 0.524 | 48.600 | 0.586 | 55.500 |
| 0.525 | 48.700 | 0.587 | 55.625 |
| 0.526 | 48.800 | 0.588 | 55.750 |
| 0.527 | 48.900 | 0.589 | 55.875 |
| 0.528 | 49.000 | 0.590 | 56.000 |
| 0.529 | 49.125 | 0.591 | 56.125 |
| 0.530 | 49.250 | 0.592 | 56.250 |
| 0.531 | 49.375 | 0.593 | 56.375 |
| 0.532 | 49.500 | 0.594 | 56.500 |
| 0.533 | 49.625 | 0.595 | 56.600 |
| 0.534 | 49.750 | 0.596 | 56.700 |
| 0.535 | 49.875 | 0.597 | 56.800 |
| 0.536 | 50.000 | 0.598 | 56.900 |
| 0.537 | 50.100 | 0.599 | 57.000 |
| 0.538 | 50.200 | 0.600 | 57.100 |
| 0.539 | 50.300 | 0.601 | 57.200 |
| 0.540 | 50.400 | 0.602 | 57.300 |
| 0.541 | 50.500 | 0.603 | 57.400 |
| 0.542 | 50.625 | 0.604 | 57.500 |
| 0.543 | 50.750 | 0.605 | 57.600 |
| 0.544 | 50.875 | 0.606 | 57.700 |
| 0.545 | 51.000 | 0.607 | 57.800 |
| 0.546 | 51.100 | 0.608 | 57.900 |
| 0.547 | 51.200 | 0.609 | 58.000 |
| 0.548 | 51.300 | 0.610 | 58.100 |
| 0.549 | 51.400 | 0.611 | 58.200 |
| 0.550 | 51.500 | 0.612 | 58.300 |
| 0.551 | 51.625 | 0.613 | 58.400 |
| 0.552 | 51.750 | 0.614 | 58.500 |
| 0.553 | 51.875 | 0.615 | 58.600 |
| 0.554 | 52.000 | 0.616 | 58.700 |
| 0.555 | 52.125 | 0.617 | 58.800 |
| 0.556 | 52.250 | 0.618 | 58.900 |
| 0.557 | 52.375 | 0.619 | 59.000 |
| 0.558 | 52.500 | 0.620 | 59.100 |
| 0.559 | 52.625 | 0.621 | 59.200 |
| 0.560 | 52.750 | 0.622 | 59.300 |
| 0.561 | 52.875 | 0.623 | 59.400 |

Before a tank car may be used for the transportation of any compressed gas other than that for which it is being used, as indicated by the name of the commodity stenciled on the tank, the owner of the car, or party authorized by the owner, must change the stenciled name, and the manhole closure, safety valve, and induction and eduction valves and pipes, as necessary to make the car suitable for the new service, and stencil date of changes and initials of owner, or party making these changes, under commodity stencil on tank. All changes must be certified to the Bureau of Explosives.

## GULF TO BUILD PLANT

The Gulf Production Co. has selected a site for a gasoline plant according to field reports. The plant will be located on the T. B. Casher lease southeast of Overton. The Gulf company has producing leases in that area. The plant which will be of the compression type will have an initial capacity of 5,000,000 feet of gas daily. The gas will have a gasoline content of approximately 2 gallons per 1,000 feet.

## BUREAU OF EXPLOSIVES OUTLINES REVISIONS VAPOR PRESSURE TEST

The Bureau of Explosives has adopted revisions in the method of taking the vapor pressure of natural gasoline which permits a greater tolerance in certain parts of the Reid bomb equipment but will not cause any variation in the results of the test. The principal change was in the tolerance permitted in the size of each of the gasoline and the air chambers. The complete procedure for taking the Reid vapor pressure test on gasoline, included below, will be an accepted method for testing all gasoline to be transported on and after March 21, 1932:

**Standard Procedure for Determining the Vapor Pressure of Natural Gasoline (Reid Method)**

**1. Scope.**—This method is intended primarily for the determination of vapor pressures of natural gasoline, but is also applicable to other inflammable liquids when and as specified in these regulations.

**Apparatus**

**2. Vapor-Pressure Bomb.**—The vapor-pressure bomb consisting of two sections or chambers, an upper section or air chamber, and a lower section or gasoline chamber, shall conform to the following requirements:

**(a) Air Chamber.**—The upper section or air chamber shall be a cylindrical vessel 2 to 2⅛ inches in diameter and 10 inches, plus or minus one-eighth inch in length, inside dimensions. In one end of the air chamber a quarter inch pipe thread shall be tapped to receive the gauge coupling. Other means of connecting the air chamber with the pressure gauge may be employed, provided the requirements of paragraphs (d) and (e) are fulfilled. In the other end of the air chamber and opening approximately one-half inch in diameter shall be provided for purpose of coupling with the gasoline bomb. The nature of this opening will depend upon the method of coupling employed. The air chamber must drain completely from either end when held in a vertical position and for this reason the ends may be slightly convex.

**(b) Gasoline Chamber for Sampling Materials at Atmospheric Pressure.**—The lower section of gasoline chamber shall be a cylindrical vessel of the same inside diameter as the air chamber and 2½ inches, plus or minus one-sixteenth inch, in inside length. In one end of the gasoline chamber an opening approximately one-half inch in diameter shall be provided for purpose of coupling with the air chamber. The nature of this opening will depend upon the method of coupling employed. The other end of the gasoline chamber shall be completely closed. The gasoline chamber must drain completely when inverted and for this reason the top may be slightly convex.

**(c) Gasoline Chamber for Sampling Materials Under Pressure.**—For testing natural gasoline where it is impracticable to obtain a sample by immersing the gasoline chamber in the liquid, as for example, gasoline in pressure storage or gasoline being transported by pipe line, the gasoline chamber shall conform to the requirements specified in paragraph 2 (b), except that a quarter-inch needle valve shall be attached near the bottom and a half-inch gate valve shall be introduced in the coupling between the chambers.

**(d) Method of Coupling Air and Gasoline Chambers.**—Any method of coupling the air and gasoline chambers may be employed, for example, a simple screw union or a clamp. The sole provision in this respect is that the assembly shall be free from leaks under the conditions of test. Responsibility for freedom from leaks rests with the user.

**(e) Volumetric Capacity of Air and Gasoline Chambers.**—The ratio of the volume of the air chamber to the volume of the gasoline chamber shall be between the limits of 3.8 and 4.2. To determine the volume of the air chamber, insert a quarter-inch plug in the gauge coupling, invert the chamber, fill with water up to and including the portion of the coupling device attached permanently to the air chamber, and then carefully measure the volume of water. To determine the volume of the gasoline chamber, fill with water up to and including the portion of the coupling device attached permanently to the gasoline chamber, and then carefully measure the volume of water.

**3. Pressure Gauge.**—The pressure gauge shall be a standard Bourdon type spring gauge 4½ to 5½ inches in diameter. The range of the gauge used shall be governed by the vapor pressure of the sample being tested, as follows: For those samples with vapor pressures not in excess of 12 pounds per square inch absolute at 100° F., the gauge shall have a 15-pound scale. For those samples with vapor pressures between 12 and 45 pounds per square inch absolute at 100° F., the upper limit of the scale of the gauge shall not be less than 45 nor more than 60 pounds. Gauges shall be checked frequently and adjusted if found in error.

**4. Water Bath.**—The water bath shall be of such dimensions that the vapor pressure bomb may be immersed to the bottom of the pressure gauge. Means for maintaining the bath at a constant temperature of 100° F., plus or minus 0.5° F., should be provided.

**5. (a) Connections.**—All permanent connections may be made tight by soldering or tinning.

**(b)** Special threads or other suitable means may be used in making the connection between the two chambers, in order to obtain a tight connection without the use of a wrench.

**Procedure**

**6. (a) Filling the Gasoline Chamber.—Sampling Materials From Tank Cars and Open Tanks.**—The empty gasoline chamber shall be first immersed in the tank or container of the liquid to be tested and allowed to fill while being raised and lowered through the liquid. This first filling is for the purpose of thoroughly washing the chamber, which should then be emptied. The chamber shall then be refilled in the same manner, care being exercised to see that it is completely filled with the liquid.

**(b) Sampling Materials From Systems Under Pressure.**—The gasoline chamber equipped with valves, top and bottom, shall be used.

Before drawing the sample, the liquid section of the gasoline chamber shall be cooled to a temperature as low as or lower than that of the gasoline to be tested. The sample shall be taken as follows:

Close both valves and connect the gasoline chamber to the tank, pipe line, or other receptacle holding the liquid to be tested, by means of the lower valve of the chamber. The sample must be taken at a place which will insure that a representative sample of the gasoline is being obtained. With the upper valve closed, open the valve on the tank or pipe line and then open the lower valve on the gasoline chamber, allowing full tank or line pressure to be exerted on the chamber. Open slightly the upper valve of the chamber and allow gasoline to escape until a volume equal to at least twice the capacity of the gasoline chamber shall have been displaced. This procedure insures the removal of all air from the chamber. The operation of purging should be accomplished without allowing the pressure in the chamber to drop below that of the tank or line. After filling the gasoline chamber, close both top and bottom valves in the order mentioned, and disconnect the chamber from the tank or pipe line. After disconnecting the gasoline chamber, attach it to the air chamber immediately; and immediately open the upper valve of the gasoline chamber. If the air chamber is not immediately attached, the gasoline chamber should be kept chilled to prevent rupturing due to expansion of its contents.

**(c) Sampling by Pouring.**—A sample shall not be transferred to the gasoline chamber by pouring unless it is impossible to obtain it by either of the methods described in paragraphs 6 (a) and (b). When this is the case, both the liquid and the gasoline chamber shall be cold enough so that no appreciable change in composition of the sample occurs during the pouring. Table 1 gives the maximum pouring temperatures for gasolines of various vapor pressures. The responsibility for errors incurred by pouring rests solely with the operator. Pouring shall not be used in referee tests.

**TABLE 1—TEMPERATURES TO WHICH GASOLINE AND GASOLINE CHAMBER SHALL BE COOLED BEFORE POURING SAMPLE.**

| Approximate vapor pressure of sample, (pounds) | Temp. of sample and chamber when pouring, °F., ± or —5° F. |
|---|---|
| 9 (or under) | 50 |
| 12 | 40 |
| 16 | 30 |
| 20 | 25 |
| 25 | 20 |
| 30 | 15 |

**(d) Sampling by Water Displacement.**—It is recommended that transfer by water displacement be used when the methods described in paragraphs 6 (a), (b) and (c) can not be employed.

**7. Test.**—Prior to each test, the air chamber, from which the gauge has been removed, shall be thoroughly purged of any gasoline vapors that may remain

(Continued on Page 90)

## ADOPT NEW GRADING SYSTEM JANUARY 1

On January 1 the new method of grading natural gasoline will come into general use throughout the Mid-Continent as the members of the Natural Gasoline Association of America drop the customary A, AA, B, BB and C specifications and adopt new ones covering a total of 24 grades.

Despite the large increase in the number of grades, a check of sales made by members of the association shows that 65 per cent or more of all spot natural gasoline now moving from their plants is what will be termed "26-70" under the new system. This grade is almost a duplicate of the AA grade and for all practical purposes the new grade 26-70 may be said to be the same as the old AA.

Under the new system, the name of the product will be derived from its Reid vapor pressure and the per cent distilling off at 140° F. Thus the 26-70 grade indicates that the material purchased as this grade will have a Reid vapor pressure of 26 pounds or under and at least 70 per cent distilling over at 140° F. For a more complete discussion of the new grading system which comes under use January 1, 1932, reference may be made to an article appearing in The Oil and Gas Journal December 25, 1930, page 30.

## ROCKY MOUNTAIN AREA

(Continued from Page 85)

feet, SW NE NE Section 28-36-12w, Milk River district, has cleaned out to 2,810 feet after cementing cavey ground.

**Toole County**

Hannah-Porter Co.'s No. 3 Iowa Holding, NW SE SE Section 2-37-4w, Buckley-Border Pool, is rated as a 150-bbl. well in the Vanalta sand at 2,500-45 feet. It has swabbed 500 bbls. to date and may plug back a few feet before completing. Cosmos Petroleum, Inc.'s No. 3 Iowa Holding, NW NE SE Section 2-37-4w, is drilling at 1,425 feet.

**UTAH**

Utah Southern Oil Co.'s No. 1 Balsey, C NE NE Section 31-23-21, Grand County, is drilling at 4,785 feet in salt.

Diamond Oil Co.'s No. 1, SE NW Section 16-8s-5e, Utah County, is drilling at 3,430 feet after rerunning and recementing 5-⅞-inch at 3,420 feet.

**Pipe Line Runs**

Average daily pipe line runs for the week ended December 26:

| | |
|---|---|
| **WYOMING** | |
| Salt Creek | 21,960 |
| Badger Basin | 50 |
| Big Muddy | 1,740 |
| Greybull | 10 |
| Dallas-Derby | 650 |
| Dutton Creek | 70 |
| Elk Basin | 620 |
| Ferris | 40 |
| Frannie | 1,610 |
| Grass Creek | 2,050 |
| Hamilton Dome | 920 |
| Hudson | 390 |
| LaBarge | 1,190 |
| Lance Creek | 230 |
| Lost Soldier | 3,800 |
| Midway | 100 |
| Oregon Basin | 200 |
| Osage | 380 |
| Pilot Butte | 40 |
| Rock River | 1,720 |
| Poison Spider | 70 |
| Total Wyoming | 37,840 |
| **MONTANA** | |
| Buckley-Border | 520 |
| Cat Creek | 930 |
| Dry Creek | 270 |
| Kevin-Sunburst | 4,780 |
| Lake Basin | 70 |
| Pondera | 1,210 |
| Total Montana | 7,780 |
| **COLORADO** | |
| Florence | 410 |
| Fort Collins | 960 |
| Iles | 920 |
| Moffat | 780 |
| Orchard | 610 |
| Rangely | 20 |
| Tow Creek | 290 |
| Total Colorado | 3,990 |
| **NEW MEXICO** | |
| Rattlesnake | 675 |
| Hogback | 410 |
| Table Mesa | 80 |
| Artesia | 400 |
| Cap Rock | 695 |
| Hobbs | 37,186 |
| Jal | 1,000 |
| Lea City | 1,812 |
| Eunice | 406 |
| Total New Mexico | 42,664 |
| Total Rocky Mountain area | 92,274 |
| Total previous week | 93,097 |
| Difference | 823 |

## BUREAU OF EXPLOSIVES OUTLINES REVISIONS

(Continued from Page 89)

from a previous test. The purging may best be accomplished by filling the air chamber with warm water (90° to 100° F.) and allowing it to drain. This operation shall be repeated at least five times. If the air chamber is purged some time before the test is made, it should be rinsed with water (temperature optional) just before the test is started Prior to each test, the gauge should be shaken to dislodge gasoline that may remain from a previous test. The gauge shall then be attached to the air chamber.

The temperature of the air and water vapor in the air chamber shall be determined by inserting a thermometer of suitable range and accuracy inside the chamber just before making the connection with the gasoline chamber. The thermometer shall be allowed to remain in the air chamber for not less than 3 minutes before the temperature is read. This temperature reading shall be recorded as the "initial air temperature." It is necessary that the initial air temperature shall be the actual temperature of the air in the air chamber when attached to the gasoline chamber. Immediately, after determining the initial air temperature, the air chamber with gauge in place shall be attached tightly to the gasoline chamber containing the sample to be tested (see paragraph 6). If a threaded coupling is employed, a little shellac or other suitable sealing material on the threads may assist in making a tight connection.

The vapor pressure bomb shall then be turned upside down and shaken vigorously in this position. This operation shall be repeated several times. The bomb shall then be immersed at least up to the bottom of the pressure gauge in the water bath, which shall be held at a constant temperature of 100° F., plus or minus 0.5° F. While the bomb is immersed in the bath, the apparatus shall be closely observed for leaks. The coupling device is normally in the liquid section of the apparatus and, because it is most in use, shall be given particular attention. Liquid leaks are more difficult to detect than vapor leaks. If a leak is detected the test shall be discarded. After 5 minutes, the bomb shall be withdrawn from the bath, inverted, shaken vigorously and replaced in the bath. Thereafter, at intervals of 2 minutes, the bomb shall be withdrawn from the bath, inverted, shaken vigorously and replaced in the bath. These operations shall be done quickly to avoid cooling the bomb and its contents.

Prior to each removal of the bomb from the bath, the gauge reading shall be observed. The gauge shdulld be tapped lightly prior to each reading. The temperature of the bath shall also be closely observed to make certain that it is within the specified limits. When consecutive gauge readings thus observed become constant, the value of the reading shall be recorded as the "uncorrected vapor pressure" of the sample under test.

**8. Calculations.** — To calculate the "Reid vapor pressure" of the sample under test, the "uncorrected vapor pressure" must be corrected for the change in the pressure of the water vapor and air in the air chamber due to the differences between the "initial air temperature" and the temperature of the bath. Table 2 shows the corrections to apply for "initial air temperatures" ranging from 32° F. to 110° F. This corrected value shall be recorded as the "Reid vapor pressure."

Note—Example: If the initial air temperature is 82° F. and the uncorrected vapor pressure is 24.6 pounds, the Reid vapor pressure is 24.6 pounds minus 0.9 pound or 23.7 pounds.

Due to the fact that the atmospheric pressure provided in the air chamber counteracts the external atmospheric pressure, the only pressure acting internally on the pressure gauge is the absolute vapor pressure of the liquid in the bomb, so that the gauge reading is the absolute vapor pressure of the liquid in pounds per square inch at 100° F. For purposes of brevity the "Reid vapor pressure" shall be recorded in pounds, without reference to temperature used in the test or to unit of surface.

**9. Accuracy.**—With proper care and attention to detail, duplicate results obtained for Reid vapor pressure values should not differ from each other by more than 0.5 pound.

**TABLE 2—CORRECTNESS TO CONVERT UNCORRECTED VAPOR PRESSURES TO REID VAPOR PRESSURES**

Correction factor:

$$\frac{(14.4-Pt)\,(t-100)-(P100-Pt)}{460+t}$$

where t = air chamber temperature at beginning of test, degrees Fahrenheit.

Pt = vapor pressure of water, pounds per square inch, at t °F.

P100 = vapor pressure of water, pounds per square inch, at 100° F.

14.4 = atmospheric pressure, pounds per square inch.

| Initial air temp. (°F.) | Correction (lbs.) |
|---|---|
| 32 | —2.9 |
| 34 | —2.8 |
| 36 | —2.7 |
| 38 | —2.7 |
| 40 | —2.6 |
| 42 | —2.5 |
| 44 | —2.5 |
| 46 | —2.4 |
| 48 | —2.3 |
| 50 | —2.2 |
| 52 | —2.1 |
| 54 | —2.0 |
| 56 | —1.9 |
| 58 | —1.8 |
| 60 | —1.8 |
| 62 | —1.8 |
| 64 | —1.7 |
| 66 | —1.6 |
| 68 | —1.5 |
| 70 | —1.4 |
| 72 | —1.3 |
| 74 | —1.3 |
| 76 | —1.2 |
| 78 | —1.1 |
| 80 | —1.0 |
| 82 | —0.9 |
| 84 | —0.8 |
| 86 | —0.7 |
| 88 | —0.6 |
| 90 | —0.5 |
| 92 | —0.4 |
| 94 | —0.3 |
| 96 | —0.2 |
| 98 | —0.1 |
| 100 | 0.0 |
| 102 | +0.1 |
| 104 | +0.2 |
| 106 | +0.3 |
| 108 | +0.5 |
| 110 | +0.6 |

It is further ordered, that compliance with the aforesaid amendments made effective by this order is hereby authorized on and after the date of approval and publication thereof; that the aforesaid regulations as further amended herein shall be and remain in force on and after March 21, 1932, except as noted, and shall be observed until further order of the commission; that copies of this order be served upon all the respondents herein, and that notice to the public be given by posting in the office of the secretary of the commission at Washington, D. C.

## EAST TEXAS FIELDS

(Continued from Page 26)

Boone, one-half mile southwest of Athens in Henderson County, is drilling at 3,890 feet in broken chalk with no showing of oil. It topped the Austin chalk at 3,520 feet, and later cored chalk from 3,780-3,800 feet with no show of oil. Elevation is 499 feet, which makes subsea datum a minus 3,391 feet when drilling at 3,890 feet. This is below the water level, consequently is considered as having small chances for making a producer.

**Railroad Commission Meets**

The Railroad Commission held its fourth regular meeting this week without giving consideration to Governor Sterling's suggestion that the commission call a hearing of operators in the East Texas Field with thought of again assuming jurisdiction there. It looks as if martial law is in East Texas to stay indefinitely, much to the relief of the majority of the landowners, producers and royalty owners who petitioned the governor to maintain troops in the field after they had heard that he had planned turning the field back to the Railroad Commission.

**Fire Extinguished**

Clark and Cowden's No. 1 Wilhite in the Hooper Survey, northern Gregg County, which caught fire on December 20 was extinguished four days later by H. C. Hanes, H. L. Patton and R. C. Showalter using a water line boom similar to the method used in extinguishing the Vitek well near London last summer. The boom was swung over the tubing, then stabbed into the tubing and water used in drowning out the fire, the water coming through the boom and entering tubing when stabbed by line. Production of well was estimated at 50 bbls. per hour.

This was the largest fire in East Texas for several months, more careful and efficient handling, and better equipment, with closer inspection of wells by the National Guard when they are brought in, keeping down fire hazards and preventing fires.

General Wolters has distributed a circular letter to operators in the district, asking them to take precautions against fires on wells. Broken flow lines and connections were set out in this letter as the cause of several of the fires in the district. He asked that operators assist in prevention of such accidents by making a connection to the casinghead of each well and laying a flow line not less than 60 feet from the well. If a well is so equipped and blows out, pumps can be attached to these lines and the fire extinguished in a short time. "This is cheap insurance," the letter says, "and may be the means of saving a number of lives and considerable property."

**COMPLETIONS IN EAST TEXAS**

**Gregg County**

Arkansas Fuel Oil Co.'s No. 4 Allison, top sand 3,563 feet, initial production 60 bbls. in 30 minutes through open tubing, total depth 3,575 feet; No. 4 Orms, top sand 3,531 feet, initial production 100 bbls. in 30 minutes through open tubing, total depth 3,559 feet. Barnsdall Oil Co.'s No. 4 Adams, top sand 3,580 feet, initial production 58 bbls. in 30 minutes through seven-eighths-inch tubing choke, total depth 3,637 feet. Chaplin and Bass' No. 1 C. C. Clements, top sand 3,590 feet, initial production 70 bbls. in 20 minutes through open tubing, total depth 3,618 feet. Harris and others' No. 1 E. T. Norton, top sand 3,617 feet, initial production 100 bbls. pinched through tubing, total depth 3,645 feet.

Humble Oil & Refining Co.'s No. 2 Killingsworth, top sand 3,607 feet, initial production 105 bbls. per hour

### THE OIL MAN'S CALENDAR

**January, 1932**

9-15—Detroit, Mich., convention and road show, American Road Builders Association, Airport Building.

9-16—New York, National Automobile show.

11—Memphis, Tenn., Tennessee Oil Men's Association, Peabody Hotel.

11-12—Fargo, N. D., North Dakota division, Northwest Petroleum Association, Waldorf Hotel.

14-15—Minneapolis, Minn., Minnesota division, Northwest Petroleum Association, Radisson Hotel.

21-22 — Oklahoma City, Okla., Oklahoma Petroleum Marketers Association.

25-29 — Detroit, Mich., annual meeting, Society of Automotive Engineers.

27-28—Milwaukee, Wis., Wisconsin Petroleum Association, Hotel Pfister.

27-28—Sioux Falls, S. D., South Dakota Independent Oil Men's Association, Carpenter Hotel.

30-February 6—Chicago, Ill., National Automobile show.

**February**

1-7—Los Angeles, Calif., third annual Oil Equipment and Engineering Exposition.

9—Louisville, Ky., Kentucky Petroleum Marketers Association, Brown Hotel.

9-10—Des Moines, Iowa, eleventh annual convention, Iowa Petroleum Association, Fort Des Moines Hotel.

17-18—Springfield, Ill., Illinois Petroleum Marketers Association, Leland Hotel.

23-25—Columbus, Ohio, Ohio Petroleum Marketers Association, Deshler-Wallick Hotel.

**March**

21-27—Los Angeles, Calif., third annual Oil Equipment and Engineering Exposition.

23-25—Detroit, Mich., Michigan Oil Men's Association, Statler Hotel.

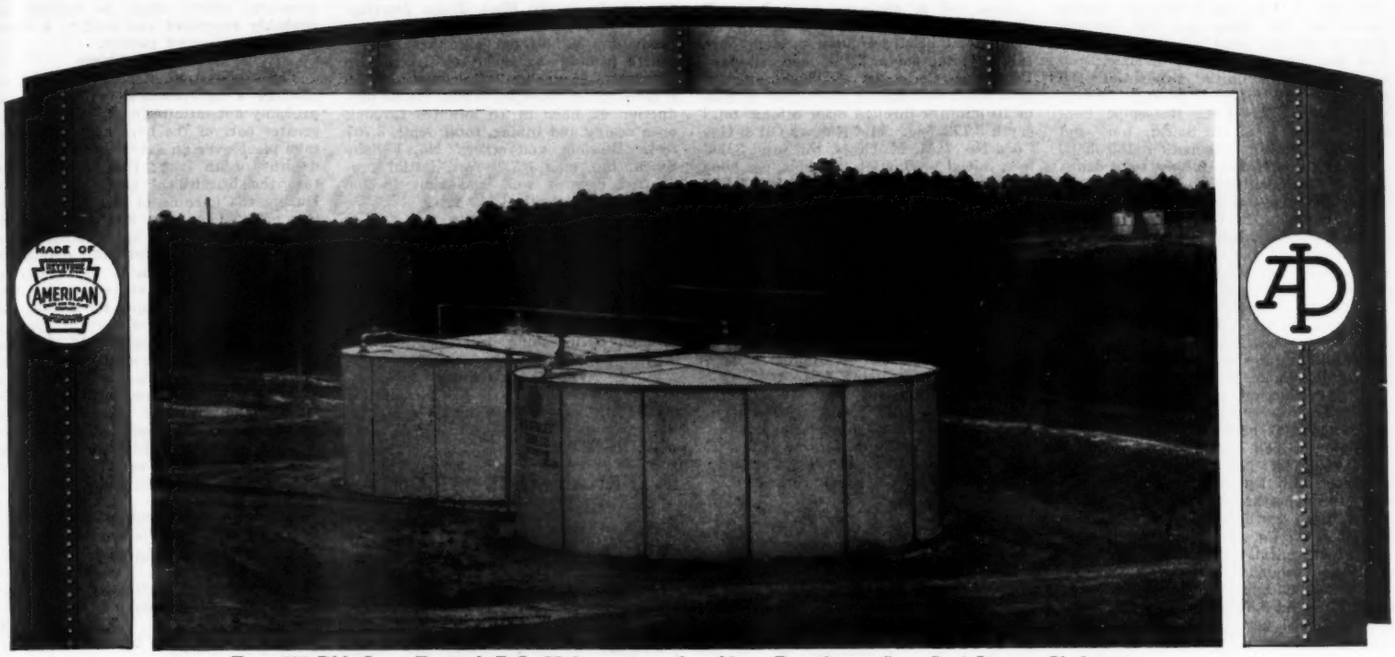
24-26 — Oklahoma City, Okla., American Association of Petroleum Geologists, Biltmore Hotel.

28-April 1—New Orleans, La., American Chemical Society.

**April**

11-16—Boston, Mass., Ninth annual convention, American Oil Burner Association.

21-22—Cleveland, Ohio, semiannual meeting, National Petroleum Association, Hotel Cleveland.




*Two 500-Bbl. Low Type A. P. I. Maloneys on the Alma Petroleum Co., Cox Lease, Gladewater, Texas. Erected by S. S. Staley Tank Co., Distributer, Tyler, Texas.*

# When Lease Tanks "Breathe"

# They Dissipate Your Earned Income

When your lease tanks "breathe," the most valuable portion of your oil escapes into the air and part of your earned income is lost. Thus you can actually increase your income without increasing your production by using our *Vapor-Pressure* Tanks—which are built to eliminate breathing losses.

Maloney *Vapor-Pressure* Tanks are made of not less than 12-gauge Keystone Copper Steel—a highly rust-resistant material. Heavy 2" angle ties and reinforcements secure ample strength. Efficient valves set at 16 ounces pressure and ½ ounce vacuum restrict the movement of vapors and protect the tank. Our special aluminum paint is made with a remarkably durable vehicle containing water-proof and alkali-proof Inhiburine.

*"Alone in Quality"*

MALONEY TANK MFG. COMPANY

38 N. Peoria Ave., Tulsa, Okla.

*Distributers at All Principal Petroleum Points*

Packed in Steel-Bound Crates for Export

through three-fourths-inch tubing choke, total depth 3,650 feet. Will H. McConnell's No. 1, top sand 3,642 feet, initial production 100 bbls. per day through pinched tubing, total depth 3,655 feet. Red Star Oil Co.'s No. 1 Lemaire, top sand 3,590 feet, initial production 100 bbls. per day pinched through tubing, total depth 3,625 feet. Roeser & Pendleton's No. 1 S. G. Smith, top sand 3,513 feet, initial production 165 bbls. per hour through open tubing, total depth 3,540 feet. Stanolind Oil & Gas Co.'s No. 1 Hobart Key, top sand 3,565 feet, initial production 23 bbls. in 15 minutes through open tubing, total depth 3,636 feet. Stanolind and Simms Oil Co.'s No. 10 Persons, top sand 3,473 feet, initial production 31 bbls. in 15 minutes through open tubing, total depth 3,525 feet. Byrd-Frost Oil Co.'s No. 6 M. B. Huey, top sand 3,589 feet, initial production 75 bbls. in 30 minutes through three-fourths-inch tubing choke, total depth 3,651 feet.

Gulf Production Co.'s No. 5 R. C. Alexander, top sand 3,534 feet, initial production 120 bbls. per hour through three-fourths-inch tubing choke, total depth 3,590 feet; No. 9 Hilburn, top sand 3,546 feet, initial production 112 bbls. per hour through three-fourths-inch tubing choke, total depth 3,558 feet. Houston and Heep Oil Co.'s No. 3 Hall, top sand 3,681 feet, initial production 175 bbls. per hour through 1-inch tubing choke, total depth 3,691 feet. Lyon Ostron's No. 1 fee, top sand 3,540 feet, initial production 100 bbls. per day pinched through tubing, total depth 3,590 feet. Paul L. Miller's No. 1 L. D. and J. T. Crim, top sand 3,543 feet, initial production 60 bbls. per hour through 1-inch tubing choke, total depth 3,583 feet. H. L. Moss' No. 2 Fann Marshall, top sand 3,496 feet, initial production 450 bbls. per day open through tubing, total depth 3,600 feet.

Sinclair Oil & Gas Co.'s No. 4 S. G. Andrews, top sand 3,447 feet, initial production 100 bbls. in 30 minutes through open tubing, total depth 3,460 feet. Wolfet Bradley's No. 2 Cole, top sand 3,501 feet, initial production 100 bbls. per day pinched, total depth 3,572 feet.

**Rusk County**

The Texas Company's No. 2 W. T. Chappell, top sand 3,732 feet, initial production 98 bbls. per hour through three-quarters-inch tubing choke, total depth 3,734 feet. Shell Petroleum Corp.'s No. 6 W. P. Moore, top sand 3,717 feet, initial production 56 bbls. in 30 minutes through open tubing, total depth 3,751 feet. Magnolia Petroleum Co.'s No. 3 H. P. Leverett, top sand 3,709 feet, initial production 44 bbls. in five minutes through 4-inch line on casing and three-fourths-inch tubing choke, total depth 3,729 feet. Arkansas Fuel Oil Co.'s No. 4 Bealle, top sand 3,642 feet, initial production 150 bbls. per hour through open 2½-inch tubing choke, total depth 3,662 feet. Beard and Hammond's No. 2 Keeling, top sand 3,721 feet, initial production 82 bbls. in 30 minutes through open tubing, total depth 3,745 feet. East Shore Oil Co.'s No. 2 Fox, top sand 3,665 feet, initial production 135 bbls. per hour through open tubing, total depth 3,690 feet.

**Rusk County**

Hamilton and others' No. 3 L. A. Gambrell, top sand 3,659 feet, initial production 44 bbls. in 30 minutes through 2½-inch tubing choke, total depth 3,678 feet. Henson Oil Co.'s No. 1 R. A. Motley, top sand 3,769 feet, initial production 65 bbls. in 30 minutes through open tubing, total depth 3,779 feet. J. L. Hinchcliffe's No. 1 L. J. Pinkston, top sand 3,643 feet, initial production 110 bbls. per hour through open tubing, total depth 3,670 feet.

Humble Oil & Refining Co.'s No. 6 P. R. Guerin, top sand 3,686 feet, initial production 50 bbls. in 30 minutes through three-fourths inch tubing choke, total depth 3,729 feet; No. 6 W. L. Price, top sand 3,746 feet, initial production 51 bbls. in 30 minutes through three-fourths inch tubing choke, total depth 3,814 feet; No. 6 J. W. Turner, top sand 3,651 feet, initial production 62 bbls. per hour through open tubing, total depth 3,749 feet; No. 7 J. W. Turner, top sand 3,638 feet, initial production 49 bbls. in 30 minutes through open tubing, total depth 3,742 feet.

Lion Oil & Refining Co.'s No. 4-B Brooks, top sand 3,649 feet, initial production 50 bbls. per hour through open tubing, total depth 3,748 feet. London Petroleum Co.'s No. 2 Thompson, top sand 3,742 feet, initial production 40 bbls. in 10 minutes through open tubing, total depth 3,772 feet. Mid-Kansas Oil & Gas Co.'s No. 7 M. M. Cross, top sand 3,606 feet, initial production 250 bbls. per hour through open tubing, total depth 3,616 feet; No. 1 M. C. Dequerin, top sand 3,617 feet, initial production 180 bbls. per hour through open tubing, total depth 3,660 feet. Mills-Bennett Production Co.'s No. 2 L. J. Pinkston, top sand 3,629 feet, initial production 100 bbls. per hour through open tubing, total depth 3,660 feet. Stedham and Thrasher's No. 1 Lillie Jones, top sand 3,768 feet, initial production 85 bbls. in 30 minutes through open tubing, total depth 3,815 feet.

The Texas Company's No. 2 Cora Hannah, top sand 3,618 feet, initial production 120 bbls. per hour through open tubing, total depth 3,627 feet; No. 3 J. W. Turner, top sand 3,678 feet, initial production 90 bbls. per hour through five-eighths inch tubing choke, total depth 3,780 feet.

**CRUDE OIL SHIPMENTS**
**Through Main Trunk Lines from East Texas Week Ending December 21**

| Company, size, location— | Dy. av. (bbls.) |
|---|---|
| Atlantic P. L., 10-in., to Atreco | 10,171 |
| Arkansas P. L., 8-in., to Shreveport | 10,559 |
| Atlas P. L., 8-in., to Shreveport | 2,472 |
| Gulf P. L., 2-8-in., to Oklahoma | 19,113 |
| Gulf P. L., 2-8-in., to Port Arthur | 11,136 |
| Houston Oil, 8-in., to Amigo | 0 |
| Humble P. L., 2-8-in., to Shreveport | 34,087 |
| Humble P. L., 2-8-in., to Todd Sta. | 40,332 |
| Liberty P. L., 8-in., to Rusk | 4,078 |
| Magnolia P. L., 10-in., to Center | 11,408 |
| Magnolia P. L., 12-in., to Corsicana | 48,453 |
| Shell P. L., 10-in., to Houston | 20,925 |
| Sinclair-Texas P. L., 10-in., to Teague | 25,899 |
| Sun-Yount Lee P. L., 10-in., to Sun City | 12,566 |
| Texas P. L., 10-in., to Douglass | 29,903 |
| Texas-Empire, 12-in., to Port Arthur | 47,258 |
| Tidal Refining, 6-in., to Carthage | 3,143 |
| Total | 331,503 |
| **Deliveries to East Texas Refiners** | |
| Beacon Refining, Henderson | 1,000 |
| Boone Refining, Arp | 375 |
| Diamond Refining, Overton | 198 |
| East Texas Refining, Longview | 3,903 |
| East Texas Refining, Friars Switch | 3,415 |
| Gladetex Refining, Gladewater | 100 |
| Gladewater Refining, Gladewater | 240 |
| Kilgore Refining, Kilgore | 501 |
| W. B. Mackey Refinery, Gladewater | 410 |
| Overton Refining, Overton | 508 |
| Sinclair Refining, Camp Switch | 980 |
| Southern Oil Refining, Reed Switch | 550 |
| Taylor Refining, Tyler | 637 |
| Total | 12,817 |
| Tank car shipments | 1,970 |
| Grand total shipments | 346,290 |

**Smith County**

C. B. Bunte, Inc.'s No. 5 I. J. Smith, top sand 3,684 feet, initial production 60 bbls. per hour through three-fourths inch tubing choke, total depth 3,696 feet. J. E. Ducas' No. 1 Colored Methodist Church (formerly East Texas Development Co.), top sand 3,798 feet, initial production 35 bbls. per hour through one-fourth inch tubing choke, total depth 3,801 feet. Magnolia Petroleum Co.'s No. 5 Loosier, top sand 3,695 feet, initial production 42 bbls. in 15 minutes through open casing and tubing, total depth 3,707 feet. Sessions and others' No. 1 Sabe Stoen, top sand 3,730 feet, initial production cleaned well and shut in for storage, total depth 3,743 feet.

**Upshur County**

Rancho Oil Co.'s No. 3 H. W. Moyers, top sand 3,585 feet, initial production 30 bbls. in 15 minutes through open tubing, total depth 3,615 feet. Trico Oil Co.'s No. 1 East Mount School, top sand 3,736 feet, initial production 125 bbls. per hour through open tubing, total depth 3,765 feet.

**Van Zandt County**

Pure Oil Co.'s No. 3 B. E. Crim, initial production per hour estimated through eleven-sixteenths inch tubing choke, total depth 2,925 feet.

## INTERNAL COMBUSTION ENGINE DETONATION

(Continued from Page 16)

tion of this increment of pressure, and concentrations will become more accentuated. This portion, at the end of the flame's travel through it, may possess a pressure of 1,000 pounds, and portion No. 5 may thereby be compressed to as high as 750 pounds/square inch, as Figure 6 suggests.

As combustion flashes through portion No. 5, it may advance at almost incredible speeds, within a medium compressed so greatly as this, and may leave this parcel momentarily in a condition of as much as 1,500 pounds/square inch, at the same time possibly producing a value of 1,000 pounds/square inch in the unburned parcel No. 6. In similar manner, portion No. 6 may finish burning at a pressure of 2,000 pounds/square inch, No. 7 at a much larger figure, and No. 8 attain 4,000 to 5,000 pounds pressure when it burns.

It becomes conceivable that with a much lower quality fuel and its higher flame velocities, this progressively cumulative effect might cause the very last particle of gaseous mixture to burn at a pressure almost infinitely great, and viciously destructive. But, fortunately, this is not the case. Ultimately, the increasing speed of the flame overtakes the process of pressure concentration that is going on in advance of the combustion. Burning flashes into a succeeding portion while it is at substantially the same pressure which existed in its predecessor when that became ignited. A peculiar type of relative constancy in flame movement may be attained, and the maximum pressures which might be created are probably restricted and held to a figure of a few thousand pounds.

**Combustion Flame**

The combustion flame which travels through a hydrocarbon fuel mixture is probably not infinitesimally narrow. The greater part of the burning process may take place over an extent of several hundredths of an inch; this would constitute the breadth of the flame proper. During the burning of the gaseous fuel, this narrow band, in leaving the immediate vicinity of the spark plug, moves relatively slowly almost until detonation begins. At that moment its speed undoubtedly accelerates at an extreme rate, the acceleration continues for a time, and then the last stage—a certain type of relative constancy—begins. At all times during detonation the most intense pressures existing inside the combustion chamber would be found within this narrow ribbon of flame, somewhat lower pressures would be produced immediately in advance of and behind the narrow area, and the values would range downward at more removed points from the region of the flame.

At the moment combustion completes its dash through the last unburned fuel, the entire gaseous mass will be completely out of equilibrium. Pressures will be intense in the right extremity of the combustion chamber illustrated, and low in the opposite direction. The high pressure gas, assisted further by the previously acquired momentum of movement towards the left existing in most of the mass, will make a violent plunge towards the left, encounter the wall of the combustion chamber and rebound in an opposite direction. Repeated continuation of such pressure wave flow will be required to expend this energy and return a state of equilibrium after many oscillations.

**Effect on Cylinder Walls**

An unbalanced pressure of only a few hundred pounds per square inch upon one edge of a piston which can never be fitted so tightly as to be incapable of microscopic tilting would certainly prove sufficient to cause the edge of that piston to bite into the cylinder wall. The succeeding oscillations in pressure could easily vibrate a light weight piston sufficiently to cause the biting effect to become destructive upon both piston and cylinder. Any part of the motor within the combustion chamber which may be subject to slight movement might be affected deleteriously by these oscillations of the gaseous mass. Under some conditions the valves may be severely damaged. On the other hand, were it possible to construct an engine with no movable parts inside the combustion chamber, where detonation would not be objectionable, this detonation might then become of substantial importance in holding down carbon deposits, through its violent sweeping action.

In the foregoing theory of the detonation phenomenon, only one unknown assumption has been employed. It is definitely accepted that the speed of combustion exceeds to a substantial degree the rate of redistribution of pressures during detonation. The various analyzed movements of the gas, described as taking place during the detonation process, are each based on familiar physical laws. The sole unproved assumption is that the velocity of the flame continues to increase with increases in pressure and/or temperature, beyond measurable limits. Such an action is more logical than it would be for its acceleration to take another course. One would not expect a rate of burning to accelerate with increases of pressure and/or temperature to a point as far as some measurements could be made, and then, after passing that position, to proceed under a new law. The one assumption certainly seems reasonably safe. With the probable construction of special apparatus consisting of revolving mirrors, slots, or the utilizations of similar principles, combined with high speed film in the making of flame pictures, the cold facts will doubtless be exposed within the near future.

It has been suggested that perhaps spontaneous combustion developed in the

## NOVEMBER GULF PORT SHIPMENTS DECREASED 2,614,365 BARRELS

HOUSTON, Tex., Dec. 28.—Shipments of oil by water from Gulf Coast ports during November totaled 17,051,334.07 bbls., a decrease of 2,614,365.33 bbls. from shipments during October. Shipments during October totaled 19,665,699.40 bbls. The drop affected all shipments, both crude and refined products, and both coastwise and export movement. The greatest decline was reflected in coastwise liftings of refined oils, which was due largely to a seasonal falling off in gasoline demand on the Atlantic Seaboard. Shipments by companies and ports follow:

| | Shipments | | | | |
|---|---|---|---|---|---|
| | Crude | | Refined | | |
| Company and terminal— | Coastwise | Export | Coastwise | Export | Total |
| Atlantic Oil Prod. So., Atreco | 879,724.58 | ..... | 6,087.02 | ..... | 885,811.60 |
| Atlantic Oil Prod. Co., Beaumont | ..... | ..... | ..... | ..... | ..... |
| Gulf Refining Co., Port Arthur | 116,451.55 | ..... | 1,727,827.10 | 187,184.16 | 2,031,462.81 |
| Humble O. & Ref. Co., Baytown | 177,128.00 | ..... | 846,239.72 | 1,540,224.41 | 2,563,592.13 |
| Humble O. & Ref. Co., Harbor Island | 2,134,699.00 | ..... | ..... | ..... | 2,134,699.00 |
| Humble O. & Ref. Co., Ingleside | 134,450.00 | ..... | ..... | ..... | 134,450.00 |
| Humble Oil & Ref. Co., Neches | ..... | ..... | ..... | ..... | ..... |
| Humble O. & Ref. Co., Texas City | 484,624.00 | ..... | ..... | ..... | 484,624.00 |
| Magnolia Pet. Co., Beaumont | *319,691.80 | ..... | 1,802,048.07 | ..... | 2,121,739.87 |
| Pure Oil Co., Smiths Bluff | 436,791.71 | ..... | 573,964.20 | 59,546.15 | 1,070,302.06 |
| Standard Oil Co. of Louisiana, Baton Rouge | 317,268.00 | ..... | 658,144.00 | 657,749.00 | 1,633,161.00 |
| Sun Oil Co., Sabine Pass | 1,229,236.60 | ..... | ..... | ..... | 1,229,236.60 |
| The Texas Company, Port Arthur | 964,067.00 | 345,175.00 | 1,079,222.00 | 373,791.00 | 2,762,255.00 |
| Total November | 7,194,132.24 | 345,175.00 | 6,693,532.11 | 2,818,494.72 | 17,051,334.07 |
| Total October | 7,471,488.64 | 925,191.44 | 8,262,819.80 | 3,006,199.52 | 19,665,699.40 |
| Decrease | 277,356.40 | 580,016.44 | 1,569,287.69 | 187,704.80 | 2,614,365.33 |

*Includes export shipments, if any.

"*Did we hear somebody say*
START THE NEW YEAR RIGHT?"

GUIBERSON
BETTER BE SAFE THAN SORRY

unburned portion of the fuel mixture when certain pressures and/or temperatures were attained, and caused this entire portion to burn instantly, constituting the detonation. The author's observation of spontaneous combustion processes has been that such methods of burning are relatively slow when compared with flame velocities. A compression ignition engine fires its charge through means of spontaneous combustion. This type of motor is also subject to detonation under some conditions. At all times, under regular operation, after this motor has been sufficiently warmed up, the charge of compressed air, at the end of the compression stroke, has sufficient pressure and temperature to start spontaneous combustion as the charge of fuel is pumped into the combustion chamber. If this fuel is sprayed in relatively slowly and steadily, no detonation takes place. But, if it is injected too rapidly, detonations frequently result. Apparently, under such a condition, fuel enters faster than spontaneous combustion can consume it, and the surplus is diffused through the charge. Within a brief interval, a flame will develop at some point or points within the mass, under the increasing temperature caused by spontaneous combustion. Then, with much unburned fuel diffused through the charge, all conditions will be present for producing a detonation of the character described in this discussion. However, if the spontaneous combustion process were of an instantaneous nature, each molecule of "surplus" fuel (distinguished from excess fuel) in succession would burn instantly whenever it came into direct contact with some of the charge of air, the rate of combustion of the unburned fuel would be controlled by the progressive time required for diffusion through the compressed air mass, this would be relatively slow, and no violence could occur, with the correct conditions existing continuously for spontaneous combustion of every molecule of fuel successively as it made contact with oxygen.

Bearing in mind all of the foregoing, the author's conviction is that substantial localization of pressure constitutes the immediate cause of detonation, which proceeds in the order outlined in this discussion, that spontaneous combustion plays no part in producing the violence of the phenomenon, and that more pronounced pressures are formed than would be encountered under a detonation procedure induced by spontaneous combustion. Further, under such reasoning, a detonation would not require of a fuel some mysterious and peculiar attribute capable of producing a vicious explosion at certain critical pressures and temperatures, but merely a simple property of continuously increasing flame velocities with growing pressures and temperatures.

### RUSK COUNTY LEASE

AUSTIN, Tex., Dec. 28.—George S. Matthews, receiver for state school land between the Berry and J. Lindley Surveys, has awarded lease on 44 acres to Tulsa Oil Co. for $20,000 cash, $30,000 out of production and a one-eighth royalty, for benefit of the state school fund.

## WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 25)

Cardinal Oil Co.'s No. 1 J. H. Tippett ("J"), 1,980 ft. from the S line and 990 ft. from the W line of Sec. 2, D. F. Robertson Sur. ..... Plugged back to 600 ft.; producing 3 bbls. daily.

Dittman's No. 1 Sanford, 330 ft. from NW and 1,650 ft. from NE of Sec. 55, Blk. 10, H.&G.N. Sur. ..... Shut down 725 ft.

Slaughter et al's No. 1 Sun Yates, 60 ft. S of Sun Oil Co.'s No. 1 Yates, Sec. 59, Blk. 1, I.&G.N. Sur. ..... Material.

**REAGAN COUNTY**

Big Lake Oil Co.'s No. 6-C University, 1,370 ft. from S and 1,000 ft. from E Sec. 12, Blk. 3 ..... Total depth 4,810 ft.; fishing pipe

**REEVES COUNTY**

Cunningham et al's No. 1 Wright, 1,320 ft. from S and W Sec. 58, Cassel's Sur. ..... Shut down 75 ft.

F. McDorman et al's No. 1 Ray Roberts et al, 2,310 ft. from S and E lines of Sec. 22, Blk. 59, P.S.L. Sur.... Shut down 105 ft.

James & Milton's No. 1 Patterson, 330 ft. from N and W of Sec. 21, Blk. 73 ..... Shut down 3,320 ft.; to set 6⅝-in. casing.

Lee O. White et al's No. 1 Hershersor, 330 ft. from N and W lines of Sec. 5, Blk. 51, Twp. 10, T.&P. Sur...S.D. 5,044 ft.

**RUNNELS COUNTY**

Dutton et al's No. 1 Dean, 5,475 ft. from NE and 1,048 ft. from NW in J. Heil Sur. No. 519 ..... Drlg. 3,270 ft.

**SCHLEICHER COUNTY**

Eastland Oil Co.'s No. 1 Joe Tisdale, C Sec. 29, Blk. M, G.H.&S.A. Sur. ..... Shut down 4,500 ft.; trying to land 6-in. casing.

Wesner et al's No. 1 Nicks, 2,310 ft. from N and 2,362 ft. from E of Sec. 77, Blk. LL, T.C. Sur. ..... Drlg. 5,265 ft.

George Wilson's No. 1 Page, Sec. 49, Blk. L, 1,320 ft. from N, 1,670 ft. from W, G.H.&S.A. Sur. ..... S.D. 5,053 ft.

**SCURRY COUNTY**

G. E. Dickman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, H.&T.C. Sur. ..... S.D. 5,041 ft.

Scurry County Oil Exchange's No. 1 Earnest, 2,310 ft. from N and W Sec. 68, Blk. 3, H.&G.N. Sur. ..... Spudded and S.D.

Seifert & Dibble's No. 1 T. M. Blackburn, 2,310 ft. from N and 2,310 ft. from W line of Sec. 153, Blk. 97, H.&T.C. Sur. ..... Shut down 2,740 ft.

**TERRELL COUNTY**

Big Bend Oil Co.'s No. 1 Bassett, C NW Sec. 155, Blk. D, M-K-T Sur. ..... S.D. 2,649 ft.

Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 5, Georgetown Ry. Sur. ..... Shut down 3,150 ft.

Miller Bros.' No. 1 Allison & Burke, C NW cor. Sec. 10, Blk. 176, T.&P. Sur. ..... S.D. 130 ft.

Mid-Kansas Oil & Gas Co.'s No. 1 Goode, 2,152 ft. from E and 330 ft. from S Sec. 26, Blk. 161, G.C.&S.F. Sur..S.D. 6,130 ft.

Jones et al's No. 1 Pankenham, C SE NW Sec. 43, Blk. B-2, C.C.S.D.&R.G.N.G. Sur. ..... S.D. 2,545 ft.

Sides et al's No. 1 Phelps, 2,157 ft. from N and 3,482 ft. from W Sec. 5, G. W. Turley Sur. ..... Drlg. 425 ft.

**TOM GREEN COUNTY**

Andrews' No. 1 Pugh, 250 ft. from N and 5,184 ft. from E, James Eldridge Sur. No. 73 ..... Shut down 453 ft.

Belding & Dutton's No. 1 Norsworthy, 1,640 ft. from S and 587 ft. from E of John McNeese Sur. ..... S.D. 760 ft; S.O. and gas 725 ft

Mintex Oil Co.'s No. 1 Campbell Est., 446 ft. from S and 630 ft. from W of Sec. 180, Dist. No. 11, S.P. Sur.... S.D. 1,994 ft.

Pratt & Hancock's No. 2 Lewis, 100 ft. N and 330 ft. E of most northerly SW cor. of Joshua S. Grant Sur. No. 2 ..... S.D. 300 ft.

**VAL VERDE COUNTY**

Independent Operators' No. 1 Whitehead, SE SE Sec. 10, Blk. 4, I.&G.N. Sur., elev. 1,175 ft. ..... S.D. 5,360 ft.

O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft. ..... S.D. 6,730 ft.

**WARD COUNTY**

Abell Bros.' No. 1 Sloan, 330 ft. from NW and NE Sec. 34, Blk. 5, H.&T.C. Sur. ..... Drlg. 850 ft.

Bradford-Bentley's No. 1 Beatty, 330 ft. from SW and NW of Sec. 3, Blk. 34, H.&T.C. Sur. ..... Top pay 2,338 ft.; drlg. 2,510 ft.

Alpine Oil & Dev. Co.'s No. 4 J. F. Boogher, 150 ft. from SE line and 150 ft. from the SW line of Tract 16, Sec. 11, Blk. 5, H.&T.C. Sur. ..... Drlg. 805 ft.

Eppenauer's No. 1 Purcell, 365 ft. from SW and 1,650 ft. from SE of Sec. 17, Blk. 34, H.&T.C. Sur. ..... Drlg. 1,040 ft.

H. V. Greer's No. 1 Carr, 150 ft. from NW and 510 ft. from SW Sec. 12, Blk. 5, H.&T.C. Sur. ..... Spudded and S.D

Gulf Prod. Co.'s No. 9 Hutchings, 330 ft. from N and 1,650 ft. from W of S 370 acres of Sec. 5, Blk. F, G.M.M.B.&A. Sur. ..... Drlg. 2,555 ft.

Gulf Prod. Co.'s No. 20 O'Brien, 1,870 ft. from N and 330 ft. from E Sec. 16, Blk. F, G.M.M.B.&A. Sur. ... Drlg. 415 ft.

Moran & Burkhart's No. 2 J. T. Sweatt et al, 3,810 ft. from the NE line and 1,170 ft. from the NW line of Sec. 12, Blk. 5, H.&T.C. Sur. ..... Shut down 321 ft.

Moran & Miles' No. 1 Boogher, 3,603 ft. from NE and 1,303 ft. from SE Sec. 11, Blk. 5, H.&T.C. Sur. ..... S.D. 715 ft.

R. F. Owen's No. 1 Lee, 1,344 ft. from NW and 4,533 ft. from SW Sec. 1, J. Howe Sur. ..... Shut down 560 ft.

Prairie Oil & Gas Co.'s No. 2 Edmonson, 330 ft. from NW and SW of Sec. 23, Blk. 5, H.&T.C. Sur. ..... Drlg. 942 ft.

Rector Oil Co.'s No. 1 Smith, 1,320 ft. from N and E, Sec. 22, Blk. A, G.M.M.B.&A. Sur. ..... S.D. 3,602 ft.

Sudderth & Carey's No. 1 J. H. Boogher et al, 150 ft. from SW and SE lines of Lot 24, Sec. 11, Blk. 5, H.&T.C. Sur. ..... Shut down 290 ft.

Shipley et al's No. 1 Monroe, 330 ft. SE SW Sec. 3, Blk. 1 ..... Total depth 4,666 ft.; set 4½-in. casing at 4,550 ft.

Stanolind Oil & Gas Co.'s No. 1 Cannon, 3,300 ft. from SE and 1,649 ft. from NE Sec. 29, Blk. B-29 ..... Location.

Stanolind Oil & Gas Co.'s No. 1 Weiss, 300 ft. from NW, 300 ft. from NE of S 100 acres, Sec. 4, Blk. 34 ..... Rigging up machine.

White et al's No. 1 Burtner, 150 ft. from NE and 515 ft. from SE of Sec. 8, Blk. 32, H.&T.C. Sur. ..... S.D. 755 ft.

**WINKLER COUNTY**

Liner Drlg. Co.'s No. 1 Campbell, 350 ft. from N and E cor. Sec. 2, Blk. B-5 ..... S.D. 4,840 ft.

Richardson's No. 1 Sealy, 330 ft. from S and W of Sec. 92, Blk. A, G.M.M.B.&A. Sur. ..... Drlg. 1,035 ft.

Sisl Richardson's No. 1 S. M. Halley, 330 ft. from the S line and 1,650 ft. from the E line, Sec. 25, School Blk. B-12 ..... Spudding 100 ft.

## EAST CENTRAL TEXAS WILDCATS

(Continued from Page 26)

Barnsdall Oil Co.'s No. 1 Grant Benson, 330 ft. from S and E lines of 50-ac. tract, W. P. Chisum Sur. .... Location.

Buchanan et al's No. 1 George Ritchie, 120 ft. N and 15 ft. W of Monzell and Currie's No. 1 Church Block No. 4, M. Dillard Sur. ..... Derrick.

Bramlette's No. 1 Goforth, 170 ft. due N of NW cor. of Sun-Hilburn-Lloyd lease in Chisum Sur. ..... Drlg. 3,200 ft.

Bob et al's No. 1 T. L. Broy, 290 ft. from E and 1,640 ft. from S of H. A. Holdt Sur. ..... Derrick.

M. T. Beeler's No. 1 Finley and Thomas, 150 ft. from N and 150 ft. from W of 10-ac. lease, C. H. Alexander Sur. ..... Derrick.

Branson et al's No. 1 J. J. Fuller, 1,050 ft. from N and 170 ft. from W of survey, M. Alexander Sur.... Drlg. 1,635 ft.

Bridwell and Fikes' No. 1 D. Lockett, 284 ft. E. 326 ft. N of SW cor. of 25-ac. lease, D. Ferguson Sur.... Derrick.

Byrd-Frost Oil Co.'s No. 1 Alexander and Strong, 330 ft. from S and E lines of 26-ac. tract, M. Tennison Sur. ..... Derrick.

Danciger Oil & Ref. Co.'s No. 1 S. Ball, located on a 2-ac. tract, Mary Van Winkle Sur. ..... Location.

Empire Gas & Fuel Co.'s No. 1 J. C. Bumpass, 330 ft. S along road from NW cor. and 330 ft. E of W line of lease, W. H. Castleberry Sur. ..... Testing 3,570 ft.

Lewis Godlin's No. 1 E. L. Walker, 330 ft. N of road, 330 ft. from E line of 80.2-ac. tract, M. Dillard Sur... Derrick.

Gulf Prod. Co.'s No. 1 M. F. Barker, 330 ft. S, 141 ft. E of NW cor. of 64-ac. lease, M. Dillard Sur. ..... Drlg. 2,870 ft.

Gulf Prod. Co.'s No. 1 J. S. Elder, center of E and W lines of 31-ac. tract, John Wilkinson Sur. ..... Drlg. 2,575 ft.

Jerry Hawkins' No. 1 Shilo Church, center 3-ac. tract, G. W. Hooper Sur. ..... Derrick.

F. Hetherington's No. 1 E. S. Haggler, on 3-ac. tract, 1,600 ft. E, 127 ft. S of NW cor. of survey, J. S. Carrithers Sur. ..... Set surface csg. 60 ft.

Humble Oil & Refining Co.'s No. 1 H. M. Lawrence, 540 ft. from N and 219 ft. from W of 100-ac. tract, David Ferguson Sur. ..... Derrick.

J. O. Hodges et al's No. 1 G. W. Ritchie, center of S 5 acres of N 10 acres of E 20 acres of Ritchie 40-ac. tract, Wm. Carlton Sur. ..... Fishing for liner.

D. L. Hoffman's No. 1 Bumpass, 360 ft. from S line and 360 ft. from W line of 10-ac. lease, W. H. Castleberry Sur. ..... Drlg. 1,800 ft.

Jackson and Bradstreet's No. 1 M. Young, center 2-ac. tract, J. R. Crosby Sur. ..... Rig up.

B. K. Isaac's No. 1 J. A. Tuttle, center of 4.5-ac. tract, H. Hathaway Sur. ..... S.D. 2,878 ft.

K. B. Oil Co.'s No. 1 Dickson, 150 ft. from S and 150 ft. from W of 5-ac. lease, Mary Van Winkle Sur.. S.D. 700 ft.

Louisiana Oil & Ref. Co.'s No. 1 W. C. Griffin, 272 ft. from S line, 330 ft. from E line of 79-ac. tract, L. B. Outlaw Sur. ..... Rig up.

Magnolia Pet. Co.'s No. 1 Redford, 330 ft. from N and W lines of 75-ac. tract, John Blair Sur. ..... Rigging up.

E. G. Moren's No. 1 C. J. Dollahite, center of W 10 acres of 60-ac. tract, D. Sanches Sur. ..... Drlg. 2,898 ft.

Morgan and McMinn's No. 1 H. L. Foster, 150 ft. W, 15 ft. N SW cor. Magnolia Foster lease, Wm. Painter Sur. ..... Waiting on cmt. to set; T.D. 3,565 ft.

Natlie Kimsey's No. 1 C. C. Crews, 330 ft. from N line and center of E and W lines of 60-ac. tract, L. Perkins Sur. ..... Derrick.

Navarro Oil Co.'s No. 1 E. L. Walker, 150 ft. out of W cor. of Block No. 1, M. Dillard Sur. ..... T.D. 3,590 ft.

Pace Pet. Co.'s No. 1 Crim-Reynolds, Blk. 136, Kilgore Townsite, Mary Van Winkle Sur. ..... Drlg. 3,520 ft.

Patrick Pet. Co.'s No. 1 Watson, 330 ft. from N line, 330 ft. from E line of lease, M. V. Winkle Sur. ... Derrick.

J. D. Patty et al's No. 1 J. C. McCormick, 207 ft. SE at right angles to Gladewater-Tyler road and 540 ft. SW of Abernathy and Kirkpatrick's No. 1 Gregston, M. Dillard Sur. ..... Location.

Ross et al's No. 1, located on Findley & Thomas 50-ac. tract, 150 ft. from S line of 6.66-ac. lease, C. H. Alexander Sur. ..... Derrick.

Shell Pet. Corp.'s No. 1 S. C. Fishborn, 330 ft. from N and E lines of 100-ac. lease, F. W. Johnson Sur.... Location.

Simms Oil Co.'s No. 1 Bob Wood, 330 ft. from N and W lines of 100-ac. tract, J. Skillum Sur. ..... Set 10-in. csg. 104 ft.

C. R. Starnes' No. 1 G. C. Dunaway, center of Blk. 5, 115 ft. S, 475 ft. W SE cor. H. R. Hokit Sur..... Drlg. 3,179 ft.

Steen Drlg. Co.'s No. 1 W. D. Lacy, 330 ft. from S and W lines of 40-ac. tract, E. H. Gresham Sur. ..... Derrick.

Sun Oil Co.'s No. 1 Calvin Brown, 330 ft. from most southerly S line and middle of E and W lines of lease, L. B. Outlaw Sur. ..... Derrick.

Sun Oil Co.'s No. 1 J. E. Rollins, 1,492 ft. from N line, 1,492 ft. from S line, 539 ft. from W and E lines of 35-ac. lease, M. Scott Sur. ..... Bldg. derrick.
Tom C. Patten's No. 1 George Walter, center of 1-ac. tract and 396 ft. from W line of lease, Mary Van Winkle Sur. ..... Location.
Travis and Wair's No. 1 A. B. Loughridge, 330 ft. from S line, 590 ft. from E line of 30-ac. lease, Thomas Johnson Sur. ..... Drlg. 1,700 ft.
Valentine Oil Co.'s No. 1 Coyne-Hughey, 6,100 ft. from S and 6,800 ft. from W of survey, Mary Van Winkle Sur. ..... Rigging up.

**HENDERSON COUNTY**

J. M. Roger's No. 1 M. N. Gussett, 150 ft. from N line, 1,000 ft. from W line of 103.5-ac. tract, L. D. Stover Sur. ..... Spudded and shut down.
South American Drlg. Co.'s No. 1 D. R. Broone, 330 ft. from N and W lines of SE 40 acres of 425-ac. tract, Thomas Parmer Sur. ..... Drlg. 2,810 ft.; top Pecan Gap 2,558 ft.

**HILL COUNTY**

Sherman-Houseman's No. 1 J. F. Griffith, in Samuel Waddell Sur. ..... S.D. 3,207 ft.

**HOPKINS COUNTY**

E. L. Chapman's No. 1 J. D. Jumper, 175 ft. from N line, 285 ft. from W line of lease, James Webb Sur. .. Drlg. 60 ft.
Roark et al's No. 1 Taylor, 220 ft. from N and W lines of 80-ac. tract in the John Polk Sur. ..... S.D. 540 ft.

**HOUSTON COUNTY**

Apex Drlg. Co.'s No. 1 Thompson Bros., 250 ft. out of NW cor. of 200-ac. tract in John Shears Sur. ..... Prepare to test.
Ramsland and Ramsland's No. 1 Pennington, 750 varas W of E line and 500 varas from S line of survey on 186-ac. tract, Ramond LaGarza Sur. ..... S.D. 1,692 ft.
C. T. McManus' No. 1 Harron, 300 ft. out of NE cor. of 327-ac. tract, J. P. Procella Sur. ..... Spudded and S.D. 37 ft.

**HUNT COUNTY**

Branson et al's No. 1 Gray ..... Location.
Russell et al's No. 1 Brooks and Quattlebaum ..... S.D. 1,455 ft.

**LAMAR COUNTY**

G. W. Davy et al's No. 1 McGustion, 450 ft. from S line, 450 ft. from W line of farm and survey, Galet Wood Sur. ..... Set 10-in. csg. 150 ft.
Optometrist Oil Club's No. 1 J. M. McFadden, 460 ft. from S and W lines of McFadden E 25-ac. tract, J. Deck Sur. ..... T.D. 1,672 ft. (corrected)

**LEON COUNTY**

Cooper et al's No. 1 Lynch, 4,000 ft. from W line and 250 ft. N from the S line of Thomas H. Gardner Sur., and in 200-ac. tract ..... S.D. 1,931 ft.
Sun Oil Co.'s No. 2 Grayson ..... Coring 5,625 ft.

**MORRIS COUNTY**

Dumas et al's No. 1 Tom Ball, 1,046 ft. from E and 248 ft. from S of 71-ac. tract, A. S. Young heirs Sur. ..... Derrick.

**NACOGDOCHES COUNTY**

Bunte et al's No. 1 A. F. Boatman, 330 ft. from S and 150 ft. from W of 67-ac. tract, William A. Moore Sur. ..... S.D. 1,605 ft.
Churchill-Armstrong's No. 1 Max W. Hart, 2,040 ft. from N line and 2,640 ft. from S of N line of survey, George Pollett Sur. ..... Derrick.
G. A. Teague's No. 1 Norris, 60 ft. NW of E line and 420 ft. S of road in 73.5-ac. tract, Hossea Y. Barbo Sur. ..... Derrick.
Gainer et al's No. 1 Nice Well, 18 miles SE of Nacogdoches, 600 ft. from S and 150 ft. from W of Wells tract in A. Cherino Sur. ..... S.D. 3,430 ft.
Joiner and Henson's No. 1 Andy Legg, 330 ft. from N and 330 ft. from W of tract, John Durst Sur. ..... S.D. 3,920 ft.
Scully & Harwell's No. 1 R. I. Driver, 1,500 ft. from SE cor. of P. B. Ballard 125-ac. tract, 15 miles SE of Nacogdoches in Patricia De Torres Sur. ..... Drlg. 3,316 ft.
Taylor-Vaughn's No. 1 Dixon Greer, 160 ft. from W and 450 ft. from N lines of 60-ac. tract in the M. G. Horrera Sur. ..... S.D. 265 ft.
Creighton Drlg. Co.'s No. 1 J. N. Stewart, center of 79-ac. tract in the Jose Ignacio Ybarbo Sur. ..... S.D. 3,226 ft.

**POLK COUNTY**

Humble Oil & Ref. Co.'s No. 1-A Onolaska Live Stock, 1,700 ft. NW along property line from most northerly E cor. of survey and 75 ft. SW at right angles, Wm. B. Hardin Sur. ..... Drlg. 900 ft.

**RAINS COUNTY**

C. H. Bayliss' No. 1 Ownby, 150 ft. N and 1,100 ft. from E of most easterly SE cor. of survey, Alexander Sur. ..... Drlg. 3,975 ft.

**RED RIVER COUNTY**

Droppleman and Bundy's No. 1 J. W. Cunningham, 250 ft. from the S and 1,066 ft. from the E lines of B. M. Ballard Sur. ..... Rig up.
Gibbs et al's No. 1 Mace (old well being drilled deeper), 1,200 varas from S line, 1,500 varas from E line of survey, Wm. Cullam Sur. ..... Cleaning out 3,475 ft.
Henson and Hudson's No. 1 H. H. Lennos, 2,790 ft. W and 300 ft. S of most easterly NE cor. of survey, J. E. Edmondson Sur. ..... Spudded and shut down.
Harris & Joiner's No. 1 E. Howison, 225 ft. S, 185 ft. W of 79-ac. tract, William Humphreys Sur. ..... S.D. 1,940 ft.
Concord Oil Co.'s No. 1 J. R. Dellahunty, 500 ft. from N of Isaac Moore Sur. and 200 ft. E of E line of Robert Glass Sur. ..... Drgl. 2,190 ft.
L. G. Priest's No. 1 J. M. Stiles, 900 varas S and 500 varas E most northerly NE cor. of Jones Bankston Sur. in the Levi Dean Sur. ..... S.D. 1,047 ft.

**ROCKWALL COUNTY**

Bucanner Oil Co.'s No. 1 H. L. Lofland, center of 69-ac. tract in W. M. Bird Sur. ..... Set 10-in. csg. 120 ft.

**RUSK COUNTY**

A. J. Brown's No. 1 Strong, J. Hallam Sur. ..... S.D. 860 ft.
Roy Bryant's No. 1 Daisy Bradford, 110 ft. from S line, 150 ft. from W line of 7-ac. lease, Juan Ximines Sur. ..... Set 10-in. csg. 150 ft.
Byrd-Frost's No. 1 Buckner, J. E. Peyton Sur. ..... S.D. 2,840 ft.
Chapman's No. 1 W. M. Futch, 330 ft. from N line and 500 ft. from E line of survey and lease, Jos English Sur. ..... Waiting on cmt. to set 3,630 ft.
F. C. Clark's No. 1 A. Johnson, center of 3-ac. lease, E. A. J. Evans Sur. ..... Drlg. 3,650 ft.
Goodgame and Eby's No. 1 W. W. Holland, 450 ft. from N line, 400 ft. from W line of survey, J. Lindley Sur. .. Rig up.
Hathaway et al's No. 1 Gray, J. M. McLain Sur. ..... S.D. 2,995 ft.
H. E. Hiden's No. 1 Varney, 100 ft. from N line, 125 ft. from E line of road, W. G. Tutt Sur. ..... Derrick.
Howell's No. 1 Irion and Motley, 200 ft. from N line, 1,270 ft. from W line of survey, J. Lindley Sur. .... Derrick.
Humble Oil & Ref. Co.'s No. 1 Ben Peterson, 463 ft. from N line, 330 ft. from W line of N line and 330 ft. from W line of 50-ac. lease, J. Lewis Sur. ..... Drlg. 159 ft.
Humble Oil & Ref. Co.'s No. 1 J. E. Arnold, 330 ft. from S and W lines of 23.5-ac. lease, H. Smith Sur. Bldg. derrick.
A. W. Jones Oil Co.'s No. 1 J. M. Grant, 346 ft. from S line, 1,076 ft. from E line of 100-ac. tract, T. J. Walling Sur. ..... S.D. 2,375 ft.
Lewis Prod. Co.'s No. 1 W. D. Peterson, 150 ft. from S and W lines of lease, J. Lewis Sur. ..... Derrick.
Louisiana Oil & Ref. Co.'s No. 1 Jernigan, 330 ft. from S line, 1,023 ft. from W line of 100-ac. lease, McCabe Sur. ..... Location.
W. H. McMurrary's No. 1 Blackwell, 238 ft. W and 247 ft. N of most westerly NE cor. of Stone's 169-ac. tract, M. J. Pru Sur. ..... Derrick.
Pitzer and West's No. 1 Mattie Giles, 150 ft. from S line, 100 ft. from E line of 13.7-ac. tract on a 1-ac. lease, M. J. Pru Sur. ..... Derrick.
Ross Seward's No. 1 Burton, J. J. Y'Barbo Sur. ..... Fishing 3,077 ft.
Shasta Oil Co.'s No. 1 H. Alexander, 330 ft. from N and W lines of 30-ac. lease, T. Grace Sur. ..... Derrick.
Stanolind Oil & Gas Co.'s No. 1 T. O. Mason, 532 ft. W of SE cor. of tract and center of N and S lines of lease, J. B. DeCadena Sur. ..... Derrick.
Stanolind Oil & Gas Co. and Pure Oil Co.'s No. 1 R. A. Moores, 330 ft. from S line, 2,378 ft. from W line of 210-ac. tract, J. B. DeCadena Sur. ..... Derrick.
Stanolind and Pure Oil Co.'s No. 1 R. J. Burton, 330 ft. from S and W lines of 145-ac. tract, Thos. M. White Sur. ..... Drlg. 1,450 ft.
Sullivan and Burch's No. 1 E. B. Alford, 550 ft. W, 150 ft. S of NE cor. of 75.75-ac. tract, Isaac G. Parker Sur. ..... Waiting on cmt. to set.
The Texas Co.'s No. 1 J. M. Price, located in the NW cor. of J. M. Price's 90-ac. lease, Thos. M. White Sur. ..... Rigging up.
The Texas Co.'s No. 1 A. W. Kersh, located in the NE cor. of A. W. Kersh's 211-ac. tract, E. B. Fowlkes Sur. ..... Drlg. 1,350 ft.
M. L. Thompson's No. 1 Price, Hugh Million Sur. ..... S.D. 3,280 ft.
Weaver and Crim's No. 1 Bean, 330 ft. from S line and midway between E and W lines of lease, H. Hobson Sur. ..... Swabbing.

**JOINER POOL—RUSK COUNTY**

Armstrong's No. 1 Alford, 151 ft. from S and 1,080 ft. from W of survey, T. J. Moore Sur. ..... Derrick.
Duncan and Holt's No. 1 R. A. Motley, 150 ft. from N line, 2,700 ft. from W line of Motley 100-ac. tract, F. Cordova Sur. ..... Waiting on cmt. to set 3,795 ft.
Jackson et al's No. 1 P. C. Warren, 390 ft. from N line, 253 ft. from E line of 45-ac. tract, J. Womack Sur. .. Drlg. in.
Mass and Tucker's No. 1 Matthews, 3,244 ft. from N, 4,356 ft. from E, Dalines Cartimas Sur. ..... S.D. 3,350 ft.
Paulett et al's No. 1 Ed Sparks, 350 ft. from E, 150 ft. from S of survey, L. C. Riggs Sur. ..... Bailed dry after small show of gas; T.D. 1,313 ft.
Pitts et al's No. 1 Freeman, 1,000 ft. N of S line and 1,000 ft. E of W line of 181-ac. tract, J. Watkins Sur. ..... Rig blew down.

**SAN AUGUSTINE COUNTY**

Smith and Baker's No. 1 Pickering Lumber Co., 6 miles N of San Augustine, E. Quick Sur. ..... Derrick.

**SMITH COUNTY**

Bunte et al's No. 1 Atkinson, 1,000 ft. from S line and 1,000 ft. from N line of 330-ac. tract, Calloway Dean Sur. ..... Derrick.
Cotton Belt Oil Co.'s No. C. S. Jackson, 500 ft. from N and 500 ft. from W of 39.88-ac. tract, Henry Mickleborough Sur. ..... S.D. 4,038 ft.
Walter Gantt's No. 1 Sebe Stone, 307 ft. from N line, 330 ft. from E line of tract, D. Shaw Sur. ..... Location.
J. R. Mecker et al's No. 1 Lewis Bacon, 990 ft. from N line, 906 ft. from W line, Wm. Sparks Sur. ..... S.D. 2,370 ft.
Tytex Oil Co.'s No. 1 Alex Weldert, 2,030 ft. from S line, 525 ft. from E line of Franklin T. Bodenheimer Sur. ..... Derrick.

**TITUS COUNTY**

Perry V. Cook's No. 1 M. C. Rogers, center of SW of Moore Sur. ..... S.D. 3,020 ft.
Joiner et al's No. 1 Clayton Brown, 1,300 ft. from E and 400 ft. from most northerly S line of V. Evans Sur. .. S.D. 2,250 ft.
J. P. Flannagan's No. 1 McGill, 450 ft. from S and 662 ft. from W of H. C. Riggs Sur. ..... S.D. 7,193 ft.

**UPSHUR COUNTY**

Cranfill & Reynold's No. 1 Milton Rash, 1,687 ft. E of W line and 330 ft. N of S line of Rash estate, E. N. Eubanks Sur. ..... T.D. 3,729 ft.; set 6⅝-in. csg.
Conservative Oil Co.'s No. 1 J. N. Tuttle, 620 ft. from E line, 320 ft. N of road, D. Ferguson Sur. ..... Derrick.
Galvez Oil Co.'s No. 1 Moore heirs, 330 ft. S, 990 ft. E of NW cor. of 50-ac. tract, D. Ferguson Sur. .... S.D. 3,650 ft.
Hawkeye Pet. Co.'s No. 1 H. Fenton, 330 ft. from W line and center of N and S lines of 13.5-ac. tract, G. W. Hooper Sur. ..... Location.
Humble Oil & Ref. Co.'s No. 1 D. C. Shelton, 273 ft. from E of W line, 150 ft. N of S line of 19.5-ac. lease, Wm. King Sur. ..... S.D. 3,742 ft.; went dead, made 25 bbls. in 4 hrs.
H. C. Hurley's No. 1 W. F. Smith, 330 ft. from E line and center of N and S lines of S 25 acres of W 50 acres of 100-ac. tract, J. Pineda Sur. ..... Rig up.
Jackson and Bradstreet's No. 1 Victory, center of 25-ac. lease, E. A. J. Evans Sur. ..... Rig up.
Magnolia Pet. Co.'s No. 1 H. Fenton, 330 ft. from S and W lines of 50-ac. tract, Wm. King Sur. ..... Testing 3,776 ft.
Murry Tool & Supply Co.'s No. 1 A. J. Sanders, 930 ft. from N line, 330 ft. from E line of 88.38-ac. tract, T. Allen Sur. ..... Drlg. 2,713 ft.
Pilot Oil Co. et al's No. 1 J. D. Ray et al, 1,050 ft. from N line, 950 ft. from S line, 990 ft. from W line of 218-ac. tract, A. H. Wood Sur. ..... S.D. 1,649 ft.
Shasta Oil Co.'s No. 1 E. E. Hall, 990 ft. from S line, 330 ft. from W line of 73.2-ac. tract, R. T. Gipson Sur. ..... S.D. 3,837 ft.
Shano Oil Co.'s No. 1 D. Rodden, 856 ft. from N and S lines, 544 ft. from W and E lines of W 40 acres of S 80 acres of 100-ac. tract, Marshall Mann Sur. .... Coring 3,780 ft.
J. A. Wood's No. 1 A. J. Sanders, 271 ft. S, 330 ft. W of NE cor. of 45-ac. lease, T. Allen Sur. ..... Rigging up.
Wolf's No. 1 Cook, center of 115-ac. tract in Jacob Walker Sur., 5 miles W of Rosewood ..... S.D. 1,100 ft.

**VAN ZANDT COUNTY**

Barton et al's No. 1 C. L. Hubbard, 600 ft. out of NE cor. of Hubbard 225-ac. tract, 3½ miles S of Canton, M. J. Cadena Sur. ..... S.D. 2,104 ft.
Kelly Oil & Gas Co.'s No. 1 Lemsford, center of Lemsford tract, John Conner Sur. ..... S.D. 2,300 ft.
Thomasson, Inc.'s No. 2 W. P. Forster, 600 ft. from N and 450 ft. from E of SW cor. of Forster 151-ac. tract in the F. Montgomery Sur. ..... S.D. 3,200 ft.
Priest et al's No. 1 B. G. Beckham, 150 ft. from S line, 23 ft. from W line of 100-ac. tract, A. S. Johnsonson Sur. ..... Drlg. 2,915 ft.
Pure Oil Co.'s No. 4 L. M. Brawner, 955 ft. E of W line of base and 200 ft. S of N line of base, John Walling Sur. ..... Drlg. 2,715 ft.
Pure Oil Co.'s No. 2 Mrs. C. White, 250 ft. E of W line, 250 ft. S of N line, John Walling Sur. ..... Derrick.
Pure Oil Co.'s No. 4 O. L. and L. L. Swain, 150 ft. S of N line, 203 ft. E of W line of lease, John Walling Sur. ..... Drlg. 2,715 ft.
Pure Oil Co.'s No. 1-T V. T. Davis, 400 ft. N of N line of Tunnell No. 8 lease, 480 ft. W of E line of Sur., Nacogdoches County School Land Sur. ..... Drlg. 5,848 ft.
Van Oil Association's No. 1 Tankersley, 200 ft. from E and 1,000 ft. from S of farm, L. Landers Sur. ..... S.D. 2,850 ft.

**WOOD COUNTY**

Talko Oil Co.'s No. 1 G. T. Ross, B. L. Smith Sur. ..... S.D. 1,550 ft.
Wood County Dev. Co.'s No. 1 Davis, approximately 180 ft. from S line of 160-ac. tract and 2½ miles S of Kantes in Sarah McDonald Sur. ..... Derrick.

# REFORMING

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# Brief Items for Petroleum Refiners

## Mitsubishi Company Now Operating New Refinery in Japan

The new refinery just completed in Japan by the Associated Oil Co. and the Mitsubishi Oil Co., Ltd., at a cost of over $2,000,000, is now in operation with a capacity of 4,000 bbls. of crude oil per day—a combination topping and cracking unit having a throughput of 3,000 bbls. per day, and a lubricating unit having a throughput of 1,000 bbls. per day. The plant has been under construction for approximately one year.

The new refinery, a complete modern refining unit, was built under the supervision of Associated engineers by the Mitsubishi Oil Co., Ltd. This company, organized for the purpose of carrying on these operations, is capitalized for 5,000,000 yen divided into 100,000 shares of capital stock of 50 yen par value and owned jointly by the Associated Oil Co. and the Mitsubishi interests.

The new refinery is equipped to manufacture gasoline, distillates, lubricating oil, fuel oil and other petroleum products which will be marketed in the Empire of Japan, Korea, Formosa and other portions of the Orient. Crude oil requirements will be provided by Associated from its California production. The plant is located on Tokyo Bay between Tokyo and Yokohama. Headquarters of the Mitsubishi Oil Co., Ltd., are in Tokyo.

The Mitsubishi Goshi Kaisha, holding company for the extensive Mitsubishi interests, with a capital of 120,000,000 yen and headed by Baron Kayata Iwasaki, is one of the most influential concerns in Japan. Through its many subsidiaries it is engaged in all of the principal industrial activities of the empire, including mining, shipbuilding, banking, importing and exporting, shipping, insurance, etc.

For many years the Mitsubishi Shoji Kaisha, a subsidiary of the parent Mitsubishi company, has acted as distributor of Associated products in Japan, and through the friendly relations thus established the new project was evolved and placed in operation.

## NOT TO OFFER SECOND GRADE ETHYL GASOLINE

NEW YORK, Dec. 28.—The Ethyl Gasoline Corp. has announced the withdrawal of its proposed contract covering the use of lead in nonpremium gasoline in the United States. In a letter to all users of Ethyl compound the company says "the proposal for the use of lead in nonpremium gasoline was formulated as a result of requests from a considerable number of our distributors. When submitted it was opposed by not only a large majority of distributors but also by some of those who had urged such a policy.

"After a thorough consideration of the matter we believe that under existing conditions the Ethyl Corp. should devote its undivided efforts to the stimulation of premium fuel business. Despite adverse economic conditions, it is believed that basic technical changes in automotive design in response to public demand for superior motor performance will lead to material growth in premium fuel sales over the next few years. The Ethyl Corp. proposes with the co-operation of its customers to take definite steps to accelerate this growth."

### MAY BUILD REFINERY

The Chaldron-Osage Oil Co. is considering the construction of a small skimming plant in the Osage Field of Wyoming. The company has production in the field.

## SAFETY STANDARDS FOR REFINERIES FALL INTO THREE CLASSIFICATIONS

By R. W. Black

Chief Safety Engineer, Standard Oil Co. (New Jersey), Elizabeth, N. J.*

By our various safety standards we endeavor to make the experiences of many available to each of our employes and to pass this accumulated experience along to our new workers.

In considering these various safety standards, codes, working procedures, specifications, etc., which influence refinery operation, it is apparent that the majority of these codes cover safety to a greater or less degree regardless of whether their principal consideration is safety or not. Considering those codes or standards which apply to safety in one way or another, it appears to me that they divide themselves into three general groups:

Group 1—Safety standards applying to individual operation or the procedure followed by an individual in performing a specific job or in the operation of a major piece of refinery equipment. A set of operating rules of this type may cover in detail the duties of a complete crew of men.

Group 2—Standard specifications covering refinery material and equipment.

Group 3—Maintenance and inspection standards.

These three groups of standards will cover the material that enters into your refinery equipment, the procedure followed in operating and maintaining it and a procedure of inspection to assure that the equipment has not deteriorated below safe limits.

Our experience has primarily dictated what these standards or operating codes contain. Many of their provisions are the direct result of previous sad experience, which we endeavor to prevent by careful instruction to our men giving them in many cases a thorough understanding of previous troubles, their cause and how they can be prevented. The particular standards in any of these groups, which are most applicable to your plant may not be those most valuable to another plant, since refinery operations will vary quite a bit from one plant to an-

(Continued on Page 98)

*Annual meeting, National Safety Council.

## Appoint Institute's Division of Refining Committees for 1932

Appointment of several American Petroleum Institute Division of Refining Committees for 1932 has been announced by D. J. Moran, Continental Oil Co., Ponca City, Okla., chairman of the divisional general committee. They include the following:

**Testing Methods and Specifications**

K. G. Mackenzie, The Texas Company, New York, chairman; R. P. Anderson, American Petroleum Institute, New York, secretary; H. T. Bennett, Mid-Continent Petroleum Corp., Tulsa; J. T. B. Bowles, Crown Central Petroleum Corp., Baltimore, Md.; F. W. Breth, W. H. Daugherty & Son Refining Co., Petrolia, Pa.; H. W. Camp, Empire Oil & Refining Co., Tulsa; S. E. Campbell, Macmillan Petroleum Products Co., Long Beach, Calif.; A. Ludlow Clayden, Sun Oil Co., Detroit, Mich.; E. W. Dean, Standard Oil Development Co., New York; T. G. Delbridge, Atlantic Refining Co., Philadelphia, Pa.; B. C. Frichot, Deep Rock Oil Corp., Cushing, Okla.; I. K. Giles, Warner-Quinlan Co., Warners, Grasselli, N. J.; R. E. Haylett, Union Oil Co. of California, Los An-

(Continued on Page 108)

## SHELL PLANS TO EXPAND PLANT AT HOUSTON, TEX.

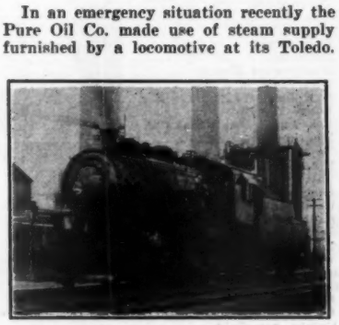
HOUSTON, Tex., Dec. 26.—The Shell Petroleum Corp. has definitely decided to start work soon after the first of the year on an important expansion program at its Houston refinery, which will increase the cracking capacity of the plant very materially.

It is understood that, while so far actual plans call for the installation only of a high pressure Dubbs cracking unit, it is probable that other major equipment will be installed with work to start in the near future.

A group of officials and engineers of the Universal Products Co. is expected here within the next week to go into plans of the company more fully as they pertain to the local refinery. It has been anticipated that an entirely new type of still is to be built at the refinery. The refinery at present has a rated crude oil capacity of 22,000 bbls. daily with a cracking capacity of 11,000 bbls. daily. The present cracking units are of the Dubbs type.

## USE LOCOMOTIVE FOR PLANT STEAM SUPPLY

In an emergency situation recently the Pure Oil Co. made use of steam supply furnished by a locomotive at its Toledo.



Ohio, refinery. The refinery's steam supply was shut off approximately 24 hours and during this period the locomotive furnished the steam necessary for processing. The picture shows the locomotive connected to the refinery at the Toledo plant.

## RUMANIA WILL FURNISH OIL FOR FRENCH PLANTS

NEW YORK, Dec. 28.—As a result of the political-commercial entente between France and Rumania, considerable crude petroleum business which had previously appeared destined for the United States will probably go to Rumania, Paris advices indicate.

The special committee of Rumanian oil men and government officials now in France is negotiating for increased sales of crude and products to France, and has suggested that Rumania be allotted 400,000 tons of crude and an equal quantity of refined products out of France's annual petroleum consumption. The plan involves supplying a considerable portion of the crude requirements of French refineries with Rumanian petroleum until the Iraq pipe line is completed.

The French Chamber of Deputies is now considering ratification of the Franco-Rumanian commercial treaty of August 27, 1930, which provides, among other things, that "the French government will examine with the utmost benevolence all applications for import permits submitted by companies dealing in Rumanian oil products" and "permits for the importation of crude or residuals for cracking, which will be the object of a common program previously discussed with the Rumanian government."

Previous indications had pointed to considerable French buying of crude in the American Gulf market.

### IMPROVING STANDARD PLANT

CASPER, Wyo., Dec. 26.—The Standard Oil Co. of Indiana is engaged in an improvement program at its local refinery. New type stills are being installed replacing old equipment. The expansion includes additional cracking capacity.

### SHUT DOWN REFINERY

The West Tulsa refinery of the Producers & Refiners Corp. has been shut down for 10 days or two weeks according to an announcement by L. R. Crawford, president of the corporation. During the shutdown the operating crew will make necessary repairs in the plant equipment.

## KANSAS CITY COMPANY IN HANDS OF RECEIVER

KANSAS CITY, Mo., Dec. 28.—The Atlantic, Pacific & Gulf Co., refining and marketing organization with headquarters in this city, was placed in the hands of a receiver here today. The receivership was sought by Dean O. Howe, son of J. P. Howe, president of the company. Mr. Howe alleged that he held an unpaid note against the company for $5,000.

The receivership was not opposed by officers as it will enable the company to preserve its assets. Nelson E. Johnson, former circuit judge, was appointed receiver. The receiver will continue the operation of the properties.

The company was organized about three years ago. Its properties include a 3,000-bbl. refinery located at Wichita Falls. The plant is shut down at present. The company also has a number of stations located in Texas, Iowa, Illinois and Missouri.

### WHITE STAR BUYS CRUDE

The White Star Refining Co. has contracted with Walter Lee McClanahan, oil producer in the Mount Pleasant Field of Michigan, calling for the delivery up to 5,000 bbls. daily of crude oil to the White Star's refinery near Detroit. The total contract is said to be for 500,000 bbls. of crude oil.

The crude oil is moved by pipe line from the field to Mount Pleasant, where it is loaded in tank cars. The seller at present has three wells with an open well production of 4,000 bbls. daily.

### NEW REFINERY FOR CALGARY

CHATHAM, Ontario, Dec. 28.—Announcement has been made of the incorporation of the Federated Oils & Refineries, Ltd., with head office in St. John, New Brunswick, and executive board in Calgary, Alberta. The company, headed by Maj. W. A. Beckett of St. John, New Brunswick, is planning to build a refinery near Calgary of between 1,500 to 2,000 bbls. daily capacity to process the crude naphtha and crude oil of independent operators. Operators are being asked to contract their output for a five-year period.

## THREE CLASSIFICATIONS FOR SAFETY STANDARDS

(Continued from Page 97)

other or from one section to another because of numerous different conditions applying.

**Scope of Standards Indicated**

A few safety standards coming within each of these groups will be mentioned as an indication of their scope.

Group 1—Safety standards applying primarily to individual operation. This group would include:

(a) Safe practices in cleaning petroleum stills.

(b) Safe practices in loading tank cars (gasoline).

(c) Regulations pertaining to the operation of fuel burners.

(d) Regulations for welding, burning and hot work in refineries.

(e) Goggle code.

(f) Handling material.

Several additional safety standards or refinery rules could be mentioned in this group that would apply to safety in refinery operation or the mechanical trades required for maintenance and construction work.

Many of you have contributed to the preparation of one or more of the Safe Practices Pamphlets of the National Safety Council. Certain of these pamphlets, which appear to have little or no connection to oil refinery problems, have been helpful to me.

Group 2—Standard specifications.

Another most important group of standards influencing the safety in any refinery is the classification which would come under specifications for material. While we do not prepare this particular group of specifications, it is our duty to be sufficiently acquainted with them to be satisfied that the material selected for the equipment in question is safe. In this respect emergency conditions must be considered for certain classes of material may satisfactorily answer the requirements of operation but must be made to withstand fire conditions or other contingencies.

**Valuable Assistance Obtainable**

Much valuable assistance in this respect can be obtained from standards which have been prepared by the American Society for Testing Materials. The American Petroleum Institute has likewise adopted a considerable number of standards applying to various types of equipment used about refineries and more particularly throughout the producing sections. The American Standards Association has also a considerable number of various standards applying to materials and also safety codes, many of which would come within the first classification.

From a safety standpoint this group of safety standards is becoming more and more important since our refinery operations have changed radically in the last few years and are continuing to change in respects that require the use of materials best suited for the service in question.

The following general type of standard specifications are available:

A.S.T.M. still bottom steel.

A.S.A. National electric code.

Group 3—Maintenance and inspection standards.

This third classification of refinery standards applies to our maintenance procedure and under this heading I refer particularly to the procedure followed in maintaining our various new types of refinery equipment which are so radically different in design and construction from the older refinery apparatus that the older methods of maintenance are not adequate to assure the proper maintenance of this new equipment.

**Frequent Surveys Important**

Under this classification, which may be difficult to outline in a code, I wish to emphasize the necessity of having each major piece of equipment completely surveyed at sufficiently frequent intervals to assure that the equipment is maintained at all times in safe condition. To attain this end, very complete records are necessary concerning the rates of corrosion which apply on various parts of the equipment and the ability of various materials which are used to withstand this corrosion.

Definite minimum limits should be established for the essential parts of the equipment so that replacements can be anticipated in advance. There are a considerable number of variables which will influence the life of various parts of the equipment. These records will soon indicate the influence of changed stocks and operating conditions on corrosion.

The standards that could be classed under this group would be:

1. Tables of limiting thickness for tubes and piping.

2. Allowable safety valve setting for drums according to their design and deteriorated thickness.

Two valuable aids in the establishment of these limits are the Boiler Construction Code and the Unfired Pressure Vessel Code of the American Society of Mechanical Engineers.

It is impossible to state that any one of these three general classifications is more important from a safety standpoint than the others. A program of carefully balancing the three together so that we are assured that the best material known for the service anticipated is used and that the equipment is then operated carefully by experienced men will give us a feeling that the best and safest equipment has been provided. This equipment will only remain safe if it is carefully and regularly inspected in sufficient detail to be sure that it has not deteriorated beyond certain definite safe limits.

By a safety program of this type, influenced by definite standards, our refinery accidents can be reduced.

## LOWER RAIL RATES TO NORTH DAKOTA POINTS

The Interstate Commerce Commission in a decision announced December 17 ordered a reduction in rates on gasoline and all petroleum products from Oklahoma and other Mid-Continent refineries to destination points in North Dakota and northwestern Minnesota. Under the order, the railroads are required to make the rates effective on or before March 15.

The decision, which affects rates to over 800 points, was made on a complaint of the International Oil Co. and the Dacotah Oil Co., jobbing concerns operating in North Dakota and Minnesota. The decision fixes rates of 32.5 per cent of first-class rates to Fargo and related points and 26.5 per cent to Mobridge, S. Dak.

Following are representative of the new and present rates in cents over 100 pounds:

| | Present | New |
|---|---|---|
| Bismark, N. Dak. | 82 | 70 |
| Grand Forks | 70 | 63 |
| Leeds | 77 | 70 |
| Burlington | 85 | 78 |
| Red Lake, Minn. | 72 | 65 |

## GOVERNMENT CHANGES PIPE LINE DEDUCTIONS

Effective January 1, the mineral leasing division of the U. S. Geological Survey will insist that all crude oil measurements and government royalty calculations be based upon 100 per cent crude less the actual basic sediment and water content. All pipe line deductions are now figured at 2 per cent, making the net 98 per cent to the producers. The Geological Survey considers this unfair as in some instances the water content and basic sediment settlings will run more than 2 per cent while in other cases it will amount to considerably less. In the case of the Government's own oil, representatives of the survey will strap the tanks and make the tests for basic sediment, and for water content. Should the percentage be less than one-half of 1 per cent, no deductions will be allowed and the purchasing companies will be required to pay for 100 per cent. Should it be more than one-half of 1 per cent, deductions will be allowed in the actual amount of the percentage. Several years ago the pipe line companies deducted 3 per cent and on the ruling of the survey it was cut to 2 per cent.

## CALIFORNIA OIL FIELD OPERATIONS FOR NOVEMBER, 1931

According to figures collected by the American Petroleum Institute, Pacific Coast office, the total production of crude oil in California for November amounted to 14,997,700 bbls., an average of 499,923 bbls. per day. This is a decrease of 4,980 bbls. per day under October production.

Total stocks of crude and all products in Pacific Coast territory decreased during the month 351,409 bbls. The total stocks at the end of the month were 168,989,769 bbls. The total stock decrease for 1931, up to November 30, was 12,043,372 bbls.

**CRUDE PETROLEUM PRODUCTION**
(Figures of production and stocks are in barrels of 42 gallons)

| | Barrels per month | Daily average Nov., 1931 | Oct., 1931 | Nov., 1930 |
|---|---|---|---|---|
| Group No. 1: | | | | |
| Coalinga | 224,741 | 7,491 | 7,568 | 8,997 |
| Elk Hills | 389,470 | 12,982 | 12,861 | 17,547 |
| Fruitvale | 84,285 | 2,810 | 2,499 | 2,500 |
| Kern River | 299,164 | 9,972 | 10,090 | 11,954 |
| Kettleman Hills | 1,800,998 | 60,003 | 59,867 | 25,300 |
| Lost Hills-Belridge | 285,324 | 9,511 | 9,348 | 6,035 |
| McKittrick | 54,925 | 1,831 | 1,819 | 3,936 |
| Midway-Sunset | 1,483,941 | 49,465 | 49,790 | 59,291 |
| Mount Poso | 256,162 | 8,539 | 8,582 | 8,805 |
| Round Mountain | 51,311 | 1,710 | 1,365 | 3,118 |
| Wheeler Ridge | 15,700 | 523 | 528 | 595 |
| Group No. 2: | | | | |
| Capitan | ..... | ..... | ..... | 7 |
| Elwood | 703,932 | 23,463 | 24,979 | 35,997 |
| Rincon | 54,696 | 1,823 | 1,783 | 2,594 |
| San Miguelito* | 8,399 | 280 | ..... | ..... |
| Santa Barbara | 5,253 | 175 | 425 | 100 |
| Santa Maria | 80,913 | 2,697 | 2,795 | 2,563 |
| Summerland | 4,030 | 134 | 148 | 251 |
| Ventura Avenue | 1,176,086 | 39,203 | 39,691 | 47,150 |
| Ventura-Newhall | 101,619 | 3,387 | 3,474 | 4,691 |
| Watsonville | 1,875 | 63 | 62 | 63 |
| Group No. 3: | | | | |
| Coyote | 312,305 | 10,410 | 10,426 | 10,402 |
| Dominguez | 330,177 | 11,006 | 12,475 | 9,900 |
| Fullerton (Brea Olinda) | 290,981 | 9,699 | 9,615 | 11,009 |
| Huntington Beach | 628,326 | 20,945 | 21,386 | 28,237 |
| Inglewood | 408,651 | 13,622 | 13,655 | 15,680 |
| Lawndale | 8,605 | 287 | 366 | 306 |
| Long Beach | 2,263,494 | 75,449 | 76,238 | 97,322 |
| Los Angeles-Salt Lake | 34,706 | 1,157 | 1,184 | 1,363 |
| Montebello | 189,714 | 6,324 | 6,386 | 7,353 |
| Newport | ..... | ..... | 6 | 40 |
| Playa Del Rey | 647,607 | 21,587 | 22,944 | 40,347 |
| Potrero | 25,626 | 854 | 1,243 | 1,781 |
| Richfield | 195,576 | 6,519 | 6,699 | 8,851 |
| Rosecrans | 101,790 | 3,393 | 3,375 | 6,348 |
| Santa Fe Springs | 1,872,666 | 62,422 | 61,146 | 93,874 |
| Seal Beach | 388,435 | 12,948 | 12,673 | 17,987 |
| Torrance | 178,130 | 5,938 | 6,082 | 10,145 |
| Whittier | 38,987 | 1,300 | 1,330 | 1,389 |
| Total November | 14,997,700 | 499,923 | 504,903 | 603,648 |
| Total October | 15,651,983 | 504,903 | | |
| Decrease | 654,283 | 4,980 | | |

*Situated between Ventura Avenue and Rincon.

**PACIFIC COAST TERRITORY PETROLEUM STOCKS**

| | Nov. 30, 1931 | Oct. 31, 1931 | Nov. stock decreases | Nov. 30, 1930 |
|---|---|---|---|---|
| Heavy crude, heavier than 20° A.P.I., including all grades fuel | 102,097,139 | 102,739,329 | 642,190 | 109,410,308 |
| Refinable crude, 20° A.P.I., and lighter | 40,133,846 | 39,948,231 | *185,615 | 42,691,166 |
| Finished gasoline, engine distillate and natural gasoline | 15,403,404 | 15,548,504 | 145,100 | 16,755,344 |
| Naphtha distillates | 3,494,072 | 3,246,287 | *247,785 | 2,598,914 |
| All other stocks | 7,861,308 | 7,858,827 | *2,481 | 8,855,038 |
| Total all stocks | 168,989,769 | 169,341,178 | 351,409 | 180,310,770 |

*Increase.

**OIL FIELD DEVELOPMENTS**

| | New rigs up | Active drilling | Completed | Daily initial output | Active producing | Abandoned wells Drillers | Abandoned wells Producers |
|---|---|---|---|---|---|---|---|
| Group No. 1: | | | | | | | |
| Coalinga | .. | ... | .. | ..... | 625 | .. | .. |
| Elk Hills | .. | ... | .. | ..... | 207 | .. | 1 |
| Fruitvale | .. | 3 | .. | ..... | 18 | .. | .. |
| Kern River | .. | ... | 1 | 190 | 944 | .. | 1 |
| Kettleman Hills | 3 | 11 | 4 | 66,279 | 26 | .. | .. |
| Lost Hills-Belridge | .. | 4 | .. | ..... | 169 | .. | .. |
| McKittrick | 1 | 1 | .. | ..... | 121 | .. | .. |
| Midway-Sunset | 1 | 1 | 1 | 200 | 1,713 | .. | 5 |
| Mount Poso | .. | 2 | .. | ..... | 70 | .. | .. |
| Round Mountain | 2 | 3 | .. | ..... | 6 | .. | .. |
| Wheeler Ridge | .. | ... | .. | ..... | 34 | .. | .. |
| Group No. 2: | | | | | | | |
| Elwood | .. | 3 | 1 | 555 | 50 | .. | .. |
| Rincon | .. | ... | .. | ..... | 33 | .. | .. |
| San Miguelito | .. | ... | 1 | 635 | 2 | .. | .. |
| Santa Barbara | .. | 1 | .. | ..... | 5 | .. | .. |
| Santa Maria | .. | 1 | .. | ..... | 169 | .. | 1 |
| Summerland | .. | ... | .. | ..... | 62 | .. | .. |
| Ventura Avenue | .. | 4 | 3 | 2,019 | 144 | .. | .. |
| Ventura-Newhall | .. | 3 | .. | ..... | 409 | 4 | .. |
| Watsonville | .. | ... | .. | ..... | 6 | .. | .. |
| Group No. 3: | | | | | | | |
| Coyote | 1 | 3 | .. | ..... | 159 | .. | .. |
| Domingues | 1 | 2 | 3 | 1,656 | 55 | .. | .. |
| Fullerton | .. | 1 | .. | ..... | 345 | .. | .. |
| Huntington Beach | 1 | 2 | .. | ..... | 308 | .. | 2 |
| Inglewood | .. | 1 | .. | ..... | †208 | .. | 1 |
| Lawndale | .. | 1 | .. | ..... | 7 | .. | .. |
| Long Beach | 1 | 16 | .. | ..... | 876 | .. | .. |
| Los Angeles-Salt Lake | .. | ... | .. | ..... | 259 | .. | .. |
| Montebello | .. | 1 | .. | ..... | 167 | .. | .. |
| Newport | .. | 2 | .. | ..... | ..... | .. | .. |
| Playa Del Rey | .. | 3 | 1 | 1,125 | 174 | 2 | .. |
| Potrero | .. | 2 | .. | ..... | 9 | .. | .. |
| Richfield | .. | 1 | .. | ..... | 145 | .. | .. |
| Rosecrans | .. | 1 | .. | ..... | 65 | .. | .. |
| Santa Fe Springs | .. | ... | 1 | 500 | 422 | .. | 3 |
| Seal Beach | .. | ... | .. | ..... | 98 | .. | .. |
| Torrance | .. | 1 | .. | ..... | 349 | .. | .. |
| Whittier | .. | ... | .. | ..... | 171 | .. | .. |
| Miscellaneous drilling | 4 | 61 | .. | ..... | .... | 12 | .. |
| Group No. 4: | | | | | | | |
| Buttonwillow gas field | .. | 2 | .. | ..... | 1 | .. | .. |
| Dudley Ridge gas field | 1 | 3 | 2 | Gas | 1 | .. | .. |
| Goleta gas field | .. | 1 | .. | ..... | 2 | 3 | .. |
| Total November | 16 | 141 | 18 | 73,159 | 8,624 | 21 | 14 |
| Total October | 23 | 151 | 13 | 18,753 | †8,644 | 13 | 12 |
| Decrease | 7 | 10 | *5 | *54,406 | 20 | *8 | *2 |
| Average for year 1930 | 30 | 434 | 63 | 48,710 | 9,632 | 21 | 27 |
| Average for year 1929 | 109 | 610 | 76 | 100,625 | 10,550 | 26 | 28 |
| Average for year 1928 | 107 | 520 | 59 | 56,802 | 10,823 | 15 | 15 |

*Increase. †Correction: October figure should have been 206; state total, 8,644.

# Snapped While Scouting With the Journal's Cameras

1—Left to right: M. L. Atkinson, Phillips Petroleum Co.; C. E. Sturdevant, Phillips Petroleum Co.; K. K. Kennedy, Phillips Petroleum Co.; L. A. Ogden, Empire Companies, Bartlesville, Okla.; R. E. Clark, Phillips Petroleum Co., and R. G. Ayers, National Supply Co. 2—Left to right: L. A. Cooke, superintendent, Shell Petroleum Corp., Drumright, Okla.; H. D. Collins, Gypsy Oil Co., Tulsa. 3—Left to right: S. H. Miley, superintendent; D. W. Silvis, clerk, and W. P. Johnston, foreman, Skelly Oil Co., Bristow, Okla. 4—Left to right: O. G. Houser, Continental Oil Co., Tulsa, and Frank L. Smith, Continental Supply Co., Cushing, Okla. 5—Left to right: Walter Lopher; R. I. Short, superintendent natural gasoline department; T. M. Calvin; C. E. Troxel, and C. W. Gibson, all of the Prairie Oil & Gas Co.

# REFINERY AND CRUDE PRICES

**Quotations on refined products are for interstate or export movement unless otherwise noted.**

## GASOLINE AND NAPHTHA

| OKLAHOMA (Group 3)— | Dec. 29 | | Dec. 22 | | Dec. 15 | |
|---|---|---|---|---|---|---|
| 50-52 450 endpoint | .02½ | | .02½ | | .02¾ | .03 |
| 56-58 450 endpoint | .02¼ | .02½ | .02½ | .02¾ | .02¾ | |
| 58-60 U. S. Motor | .02½ | .03 | .02¾ | .03 | .02¾ | .03¼ |
| 60-62 430 endpoint | .02¾ | .03 | .02¾ | .03 | .02⅞ | .03⅛ |
| 60-62 400 endpoint | .02¾ | .03¼ | .02⅞ | .03¼ | .03 | .03⅛ |
| 64-66 375 endpoint | .03⅛ | .03¾ | .03¼ | .03⅜ | .03¼ | .03¾ |
| 68-70 360 endpoint | .03⅜ | .04 | .03¾ | .04¼ | .03¾ | .04 |
| 64-66 437 endpoint (blend) | .02½ | .03 | .02¾ | .03 | .02¾ | .03 |
| NORTH TEXAS— | | | | | | |
| 50-52 450 endpoint | .02½ | | .02½ | .02¾ | .02⅝ | .02¾ |
| 58-60 450 endpoint | .02½ | | .02½ | | .02½ | .02¾ |
| 58-60 U. S. Motor | .02½ | .02¾ | .02½ | .02¾ | .02⅝ | .03 |
| 60-62 400 endpoint | .02¾ | .03 | .02¾ | .03 | .02¾ | .03 |
| 64-66 390 endpoint | .03 | .03½ | .03 | .03¼ | .03 | .03½ |
| 64-66 375 endpoint | .03½ | .03¼ | .03¼ | .03½ | .03¼ | .03½ |
| 68-70 360 endpoint | .03½ | .04 | .03½ | .04 | .03½ | .04 |
| 64-66 437 (blend) | .02½ | .02¾ | .02½ | .02¾ | .02½ | .02¾ |
| *NORTH LOUISIANA— | | | | | | |
| 58-60 U. S. Motor | .03 | .03¼ | .03¼ | .03½ | .03½ | .03¾ |
| *ARKANSAS— | | | | | | |
| 58-60 U. S. Motor | .03 | .03¼ | .03¼ | .03½ | .03½ | .03¾ |
| PENNSYLVANIA— | | | | | | |
| 52-54 Naphtha | .04¼ | | .04¼ | | .04¼ | |
| 54-56 Naphtha | .04¼ | | .04¼ | | .04¼ | |
| 58-60 Gasoline | .04½ | | .04½ | | .04½ | .04⅜ |
| 60 Gasoline | .04½ | .04¾ | .04½ | .04¾ | .04⅝ | .04⅞ |
| 62 Gasoline | .04¾ | | .04⅞ | .05 | .05 | .05¼ |
| 64 Gasoline | .05 | | .05 | .05¼ | .05¼ | .05⅜ |
| 68-70 350 endpoint gasoline | .05¼ | | .05½ | .05¾ | .05¾ | .06 |
| CALIFORNIA— | | | | | | |
| †54-58 U. S. Motor (domestic) | .06¼ | .07 | .06¼ | .07 | .06¼ | .07 |
| †58-60 400 endpoint domestic gasoline | .07 | .07¾ | .07 | .07¾ | .07 | .07¾ |
| CHICAGO DISTRICT (Based on Group 3)— | | | | | | |
| 50-62 450 endpoint (Naphtha) | .02½ | .02¾ | .02½ | .02¾ | .02⅝ | .02¾ |
| 58-60 U. S. Motor | .02½ | .02⅞ | .02⅝ | .03 | .02¾ | .03 |
| 60-62 400 endpoint | .02¾ | .03⅛ | .02⅞ | .03¼ | .03⅛ | .03⅝ |
| 64-66 375 endpoint | .03¼ | .04 | .03½ | .04 | .03½ | .04 |
| 68-70 360 endpoint | .03⅝ | .04⅛ | .03⅝ | .04⅛ | .03⅝ | .04⅛ |
| 64-66 437 endpoint (blend) | .02¾ | .03 | .03 | .03¼ | .03 | .03¼ |
| GULF COAST (Export)— | | | | | | |
| 58-60 U. S. Motor | .04¾ | | .04¾ | | .04¾ | |
| 60-62 400 endpoint | .04⅞ | | .04⅞ | | .04⅞ | |
| 61-63 390 endpoint | .04⅞ | | .04⅞ | | .04⅞ | |
| 64-66 375 endpoint | .04⅞ | .05 | .04⅞ | .05 | .05 | |

*Louisiana, Arkansas and Mississippi delivery. †For Pacific Coast consumption.

## NATURAL GASOLINE

| OKLAHOMA (Group 3)— | Dec. 29 | | Dec. 22 | | Dec. 15 | |
|---|---|---|---|---|---|---|
| Grade A, 72-79.9, 375 e.p., rec. 90% | .02½ | | .02½ | | .02¾ | .03 |
| Grade AA, 80-87.9, 375 e.p., rec. 90% | .02 | | .02 | .02⅛ | .02⅜ | .02½ |
| Grade B, 76-83.9, 375 e.p., rec. 85% | .01⅞ | | .02 | | .02⅜ | |
| Grade BB, 84-92, 375 e.p., rec. 85% | .01⅞ | | .01⅞ | .02 | .02¼ | .02⅜ |
| Grade C, 80-92, 375 e.p., rec. 78% | .01¾ | | .01⅞ | .02 | .02¼ | |
| NORTH TEXAS— | | | | | | |
| Grade A, 72-79.9, 375 e.p., rec. 90% | .02¼ | .02½ | .02¼ | .02½ | .02⅝ | .02¾ |
| Grade AA, 80-87.9, 375 e.p., rec. 90% | .01¾ | | .02 | | .02⅜ | .02½ |
| Grade B, 76-83.9, 375 e.p., rec. 85% | .01⅞ | | .02 | | .02¼ | |
| Grade BB, 84-92, 375 e.p., rec. 85% | .01⅞ | | .01⅞ | | .02¼ | .02¼ |
| Grade C, 80-92, 375 e.p., rec. 78% | .01⅞ | | .01⅞ | | .02⅛ | .02½ |
| NORTH LOUISIANA— | | | | | | |
| Grade AA, 80-87, 375 e.p., rec. 90% | .02¼ | | .02½ | | .02½ | |
| Grade BB, 84-92, 375 e.p., rec. 85% | .02 | | .02¾ | | .02¾ | |
| Grade C, 80-92, 375 e.p., rec. 78% | .02 | | .02¼ | | .02¼ | |
| CALIFORNIA— | | | | | | |
| 75-78 375 endpoint | .05¾ | .06½ | .05¾ | .06½ | .05¾ | .06½ |
| CHICAGO DISTRICT (Based on Group 3)— | | | | | | |
| Grade A, 72-79.9, 375 e.p., rec. 90% | .02½ | | .02½ | .02¾ | .02⅝ | .02¾ |
| Grade AA, 80-87.9, 375 e.p., rec. 90% | .02 | | .02¼ | .02½ | .02⅜ | .02½ |
| Grade BB, 84-92, 375 e.p., rec. 85% | .01⅞ | | .02¼ | | .02¼ | |

## BURNING OIL

| OKLAHOMA (Group 3)— | Dec. 29 | | Dec. 22 | | Dec. 15 | |
|---|---|---|---|---|---|---|
| 41-43 water white kerosene | .02⅜ | .02½ | .02⅜ | .02½ | .02¼ | .02⅜ |
| 42-44 water white kerosene | .02½ | | .02½ | | .02⅜ | .02⅝ |
| NORTH TEXAS— | | | | | | |
| 41-43 water white kerosene | .02¼ | .02⅜ | .02¼ | .02⅜ | .02¼ | .02⅜ |
| 40-41 water white kerosene | .02¼ | | .02¼ | | .02⅛ | .02¼ |
| *NORTH LOUISIANA— | | | | | | |
| 41-43 water white kerosene | .03 | | .03 | | .03 | |
| *ARKANSAS— | | | | | | |
| 41-43 water white kerosene | .03 | | .03 | | .03 | |
| PENNSYLVANIA— | | | | | | |
| 43 Kerosene prime white | .04 | | .04 | | .03⅞ | .04 |
| 45 Kerosene water white | .04¼ | | .04½ | | .04⅛ | .04¼ |
| 46 Kerosene water white | .04⅜ | | .04⅝ | | .04¼ | .04⅜ |
| CALIFORNIA— | | | | | | |
| 38-40 water white Kero. (high burning test) | .04½ | .05½ | .04½ | .05½ | .04½ | .05½ |
| CHICAGO DISTRICT (Based on Group 3)— | | | | | | |
| 41-43 water white kerosene | .02¾ | .02½ | .02¼ | .02⅜ | .02¼ | .02¼ |
| 42-44 water white kerosene | .02½ | .02¾ | .02⅜ | .02½ | .02¼ | .02⅜ |
| GULF COAST (Export)— | | | | | | |
| 41-43 prime white | .04 | .04¼ | .04 | .04¼ | .04 | .04¼ |
| 41 prime white | .03¾ | .04 | .03¾ | .04 | .03¾ | .04 |

*Louisiana, Arkansas, Mississippi and East Texas delivery.

## FUEL OIL

| OKLAHOMA (Group 3)— | Dec. 29 | | Dec. 22 | | Dec. 15 | |
|---|---|---|---|---|---|---|
| Below 18 gravity Fuel Oil (per bbl.) | .22½ | .27½ | .22½ | .27½ | .22½ | .27½ |
| 18-22 Fuel Oil, per bbl. | .25 | .30 | .25 | .30 | .25 | .30 |
| 20-22 Fuel Oil, per bbl. | .27½ | .35 | .27½ | .35 | .27½ | .35 |
| 22-26 Fuel Oil, per bbl. | .30 | .35 | .32½ | .37½ | .32½ | .37½ |
| 24-26 Fuel Oil, per bbl. | .35 | .40 | .35 | .40 | .35 | .40 |
| 26-30 Fuel Oil, per bbl. | .40 | .45 | .40 | .45 | .40 | .45 |
| 28-30 Fuel Oil, per bbl. | .45 | .50 | .45 | .50 | .45 | .50 |
| 32-36 Gas oil (industrial) | .01⅜ | .01½ | .01⅜ | .01½ | .01⅜ | .01½ |
| 32-36 Gas Oil (straw color, high cold test) | .01¼ | .01⅜ | .01¼ | | .01¼ | |
| 32-36 Gas Oil (straw color, low cold test) | .01⅜ | .01¾ | .01⅝ | .01¾ | .01⅝ | .01¾ |
| 36-38 Distillate | .01¾ | .02 | .01¾ | .01⅞ | .01⅝ | .01⅞ |
| 38-40 Straw Distillate | .01¾ | .02⅛ | .01¾ | .02 | .01¾ | .02 |

Note—Fuel oils over 40 cold test when available generally 5 to 10 cents per barrel less.

| NORTH TEXAS— | | | | | | |
|---|---|---|---|---|---|---|
| Below 20 gravity Fuel Oil, per bbl. | .30 | .40 | .35 | .40 | .35 | .40 |
| 24-26 Fuel Oil, per bbl. | .40 | .45 | .40 | .45 | .40 | .45 |
| 32-36 Gas Oil (industrial) | .01¼ | .01⅜ | .01¼ | .01⅜ | .01¼ | .01⅜ |
| 38-40 Straw Distillate | .01⅜ | .01¼ | .01⅜ | .01¼ | .01⅜ | .01¼ |
| *NORTH LOUISIANA— | | | | | | |
| 18-20 Fuel Oil, per bbl. | .35 | .50 | .35 | .50 | .35 | .50 |
| 30-32 Gas Oil (low cold test) | .02 | .02¼ | .02 | .02¼ | .02 | .02¼ |
| *ARKANSAS— | | | | | | |
| 33-36 Distillate | .02 | .02¼ | .02 | .02¼ | .02 | .02¼ |
| 30-32 Gas Oil | .01¾ | .02 | .01¾ | .02 | .01¾ | .02 |
| 16-22 Refinery Fuel Oil, per bbl. | .40 | .50 | .40 | .50 | .40 | .50 |
| GULF COAST (South Texas)— | | | | | | |
| Gas Oil | .02¼ | .02½ | .02¼ | .02½ | .02¼ | .02½ |
| Bunker C Fuel (cargo lots), per bbl. | .40 | .50 | .40 | .45 | .40 | .45 |
| PENNSYLVANIA— | | | | | | |
| 30-34 Gas Oil | .02½ | | .02½ | | .02½ | |
| 36-40 Gas Oil | .02½ | | .02½ | | .02½ | .02¾ |
| CALIFORNIA— | | | | | | |
| ‡42-45 480 endpoint engine distillate | .07 | .08 | .07 | .08 | .07 | .08 |
| 15-19 Fuel Oil, Bunker (at tidewater), bbl. | .60 | .80 | .60 | .80 | .60 | .80 |
| 15-19 Fuel Oil, cargo lots (tidewater), bbl. | .55 | .75 | .55 | .75 | .55 | .75 |
| †15-19 Fuel Oil (f.o.b. tank cars), bbl. | .45 | .75 | .45 | .75 | .45 | .75 |
| 27 plus Diesel, per bbl. | .80 | 1.00 | .80 | 1.00 | .80 | 1.00 |
| 30-34 Gas Oil | .85 | 1.05 | .85 | 1.05 | .85 | 1.05 |
| CHICAGO DISTRICT (Based on Group 3)— | | | | | | |
| 18-22 Fuel Oil, per bbl. | .20 | .25 | .25 | .30 | .25 | .32½ |
| 22-26 Fuel Oil, per bbl. | .30 | .37½ | .35 | .40 | .35 | .40 |
| 28-30 Fuel Oil, per bbl. (zero) | .50 | .60 | .50 | .55 | .50 | .55 |
| 32-36 Gas Oil (industrial) | .01¼ | .01½ | .01¼ | .01½ | .01⅜ | .01⅝ |
| 32-36 Gas Oil (zero) | .01¾ | .01⅞ | .01⅝ | .01¾ | .01¾ | .01⅞ |
| 38-40 Straw Distillate | .01⅞ | .02⅛ | .01⅞ | .02 | .01⅞ | .02 |

*Louisiana, Arkansas, Mississippi and East Texas delivery. †Lowest priced fuel oil has high sulphur content. ‡For Pacific Coast consumption.

## LUBRICATING OIL AND WAX

| OKLAHOMA (Group 3)— | Dec. 29 | | Dec. 22 | | Dec. 15 | |
|---|---|---|---|---|---|---|
| 100 vis., 2 color, 20-25 cold test | .04¼ | .04½ | .04¼ | .04½ | .04¼ | .04½ |
| 100 vis., 3 color, 20-25 cold test | .04 | | .04 | | .04 | |
| 150 vis., 3 color, 20-25 cold test | .06½ | .06¾ | .06½ | .06¾ | .06½ | .06¾ |
| 150 vis., 4 color, 20-25 cold test | .06¾ | .06 | .06¾ | .06 | .05¾ | .06 |
| 180 vis., 3 color, 23-28 cold test | .08 | .08¼ | .08 | .08¼ | .08 | .08¼ |
| 180 vis., 4 color, 23-28 cold test | .07½ | .07¾ | .07½ | .07¾ | .07½ | .07¾ |
| 180 vis., 5 color, 23-28 cold test | .06¾ | .07 | .06¾ | .07 | .06¾ | .07 |
| 200 vis., 3 color, 23-28 cold test | .08½ | .09½ | .09 | .09½ | .09 | .09½ |
| 200 vis., 4 color, 23-28 cold test | .08¼ | .09 | .08¾ | .09 | .08¾ | .09 |
| 200 vis., 5 color, 23-28 cold test | .07½ | .08 | .07¾ | .08 | .07¾ | .08 |
| 240 vis., 3 color, 25-30 cold test | .10½ | .10¾ | .10½ | .10¾ | .10½ | .10¾ |
| 240 vis., 4 color, 25-30 cold test | .09¾ | .10½ | .09¾ | .10½ | .09¾ | .10¼ |
| 240 vis., 5 color, 25-30 cold test | .09¼ | .09½ | .09¼ | .09½ | .09¼ | .09½ |
| 280 vis., 3 color, 25-30 cold test | .12 | .12½ | .12 | .12½ | .12 | .12½ |
| 280 vis., 4 color, 25-30 cold test | .11 | .11½ | .11 | .11½ | .11 | .11½ |
| 280 vis., 5 color, 25-30 cold test | .10¼ | .10½ | .10¼ | .10½ | .10¼ | .10½ |
| Cylinder Stocks: | | | | | | |
| 600, steam refined, light green | .04 | .06 | .04 | .06 | .04 | .06 |
| 600, steam refined, dark green | .03½ | .05 | .03½ | .05 | .03½ | .05 |
| 190-200 vis., D color, Bright Stocks | .19 | .20 | .19 | .20 | .19 | .20 |
| 150-160 vis., D color, Bright Stocks 0-10 c.t. | .17½ | .18 | .17½ | .18 | .17½ | .18 |
| 150-160 vis., D color, Bright Stocks 10-25 c.t. | .17 | .17½ | .17 | .17½ | .17 | .17½ |
| 150-160 vis., D color, Bright Stocks 25-40 c.t. | .16½ | .17 | .16½ | .17 | .16½ | .17 |
| 150-160 vis., E color, Bright Stocks | .16½ | | .16½ | | .16½ | |
| Waxes: | | | | | | |
| 124-126 White Crude Scale Wax | .01⅝ | .01⅞ | .01⅝ | .01⅞ | .01⅝ | .01⅞ |

All bright stock prices are for domestic movement.

| PENNSYLVANIA— | | | | | | |
|---|---|---|---|---|---|---|
| 34 Neutral | .05½ | .05¾ | .05½ | .05¾ | .05½ | .05¾ |
| 34 Sundebloom | .05 | .05¼ | .05 | .05¼ | .05 | .05¼ |
| 36 Miners' Neutral | .05½ | | .05½ | | .05½ | |
| 150, 3 color | .15 | .16 | .15 | .16 | .16 | .16¼ |
| 180, 3 color | .18 | .18½ | .18 | .18½ | .18 | .19¼ |
| 200, 3 color | .19½ | .20 | .19½ | .20 | .20 | .20¾ |
| 220, 3 color | .22 | .22½ | .22 | .22½ | .22½ | .24 |
| 600, steam refined | .11 | .11¾ | .11 | .11¾ | .11¾ | .12 |
| 650, steam refined | .14 | .15 | .14 | .15 | .15 | .15½ |
| 600, Pennsylvania Flash | .16 | .16½ | .16 | .16½ | .16½ | .18 |
| 600, E filtered | .14 | .16 | .14 | .16 | .16 | .17½ |
| 600, D filtered, Oil City | .19 | .21 | .19 | .21 | .22 | |
| Pennsylvania Bright Stocks below 35 c.t. | .20 | .21 | .20 | .21 | .21 | .22 |
| Pennsylvania Bright Stocks above 35 c.t. | .19 | .20 | .19 | .20 | .20 | .21 |
| *122-124 White Crude Scale Wax | .02⅛ | | .02⅛ | | .02⅛ | |
| *124-126 White Crude Scale Wax | .02⅛ | | .02⅛ | | .02⅛ | |

*At New York.

| GULF COAST (South Texas)— | | | | | | |
|---|---|---|---|---|---|---|
| 100 vis., 2-2½ color, pale oil | .05 | .05¼ | .05 | .05¼ | .05¼ | .05¾ |
| 200 vis., 3 color, pale oil | .07 | .07¼ | .07 | .07¼ | .07½ | .07⅝ |
| 300 vis., 3 color, pale oil | .07¾ | .08 | .07¾ | .08 | .08¼ | .08⅞ |
| 500 vis., 3½ color, pale oil | .09 | .09¼ | .09 | .09¼ | .09⅞ | .10⅜ |
| 750 vis., 3½ color, pale oil | .10 | .10¼ | .10 | .10¼ | .11⅜ | .11⅞ |
| 1,200 vis., 3½ color, pale oil | .12 | .12¼ | .12 | .12¼ | .13⅞ | .14⅜ |
| 2,000 vis., 4 color, pale oil | .14 | .14½ | .14 | .14½ | .14⅞ | .15⅜ |
| 200 vis., 5-6 color, red oil | .06 | .06¼ | .06 | .06¼ | .06⅜ | .06⅞ |
| 300 vis., 5-6 color, red oil | .06¾ | .07 | .06¾ | .07 | .07⅞ | .08⅜ |
| 500 vis., 5-6 color, red oil | .08 | .08¼ | .08 | .08¼ | .09½ | .09⅝ |
| 1,200 vis., 5-6 color, red oil | .11 | .11¼ | .11 | .11½ | .12⅞ | .13⅜ |
| 2,000 vis., 6 plus color | .13 | .13¼ | .13 | .13¼ | .14⅞ | .15⅜ |
| CALIFORNIA— | | | | | | |
| 130 vis., 2½-3 color | .08¼ | .08⅜ | .08¼ | .08⅜ | .08¼ | .08⅜ |
| 200 vis., 2½-3 color | .09¼ | .10¼ | .09¼ | .10¼ | .09¼ | .10½ |
| 300 vis., 3-3½ color | .10¼ | .11¼ | .10¼ | .11¼ | .10¼ | .11¼ |

# REFINERY AND CRUDE PRICES

**Quotations on refined products are for interstate or export movement unless otherwise noted.**

| | | | | | | |
|---|---|---|---|---|---|---|
| 350 vis., 3½-4 color | .11¼ | .12 | .11¼ | .12 | .11¼ | .12 |
| 450 vis., 3½-4 color | .12 | .12¾ | .12 | .12¾ | .12 | .12¾ |
| 550 vis., 3½-4 color | .12¾ | .13¾ | .12¾ | .13¾ | .12¾ | .13¾ |
| Red Neutral: | | | | | | |
| 200 vis., 4½-5 color | .09¾ | .10¼ | .09¾ | .10¼ | .09¾ | .10¼ |
| 300 vis., 5-6 color | .10½ | .11 | .10½ | .11 | .10½ | .11 |
| 500 vis., 4½-5 color | .12¾ | .13½ | .12¾ | .13½ | .12¾ | .13½ |
| 600 vis., 6½ plus color | .13½ | .14¼ | .13¼ | .14¼ | .13½ | .14¼ |
| 700 vis., 6½ plus color | .14½ | .15¼ | .14½ | .15¼ | .14½ | .15¼ |

Note—Bright stocks are not manufactured commercially on the Pacific Coast.

## NEW YORK (BAYONNE) EXPORT PRICES

| | Dec. 29 | | Dec. 22 | | Dec. 15 | |
|---|---|---|---|---|---|---|
| Gaso. U.S.M., 58-60, 437 e.p., 65 o.n. (min.) | .06½ | | .06½ | | .07 | |
| Gaso. U.S.M., 58-60, 437 e.p., below 65 o.n. | .05¾ | .06 | .05¾ | .06 | .06½ | |
| Kerosene, water white, 41-43 | .06 | | .06 | | .06 | |
| *Fuel Oil, Bunker "C" | .60 | | .60 | | .60 | |
| †Fuel Oil, Diesel, 28-30, per bbl. | 1.20 | | 1.20 | | 1.20 | |
| Gas Oil, 28 gravity plus | .03¾ | .04 | .03¾ | .04 | .03¾ | .04 |
| 25 pale Paraffin Oil, tank car | .10¼ | | .10¼ | | .10¼ | |
| 28 pale Paraffin Oil, tank car | .07¼ | | .07¼ | | .07¼ | |
| 200 red Paraffin Oil, tank car | .12½ | | .12½ | | .12½ | |
| 250 red Paraffin Oil, tank car | .11½ | | .11½ | | .11½ | |
| 225 red Paraffin Oil, tank car | .10 | | .10 | | .10 | |
| 200 red Paraffin Oil, tank car | .09¼ | | .09¼ | | .09¼ | |
| Domestic heat. oil, min. 32 grav., tank car. | .03½ | | .03½ | | .03½ | |
| Refined Wax: | | | | | | |
| 120-122 a.m.p., per lb. | .02¾ | | .02¾ | | .02¾ | |
| 125-127 a.m.p., per lb. | .02⅞ | | .02⅞ | | .02⅞ | |
| 130-132 a.m.p., per lb. | .03⅛ | | .03⅛ | | .03⅛ | |
| 133-135 a.m.p., per lb. | .03⅞ | .04 | .03⅞ | .04 | .03⅞ | .04 |
| 135-137 a.m.p., per lb. | .04¼ | | .04¼ | | .04¼ | |
| Petrolatum in barrels in carload lots, per pound: | | | | | | |
| Dark green | .01¾ | | .01¾ | | .01¾ | |
| Amber | .02½ | | .02½ | | .02½ | |
| Extra amber | .03 | | .03 | | .03 | |
| Cream | .05½ | | .05½ | | .05½ | |
| Lily white | .06½ | | .06½ | | .06½ | |
| Snow white | .07 | | .07 | | .07 | |

*Lighterage 5 cents a barrel extra. †Lighterage 6.5 cents a barrel.

## NEW YORK (BAYONNE) REFINERY PRICES

| | Dec. 29 | | Dec. 22 | | Dec. 15 | |
|---|---|---|---|---|---|---|
| 600, steam refined cylinder stocks, in bbls.. | .20 | .21 | .20 | .21 | .21 | .22 |
| 635, steam refined | .22 | .23 | .22 | .23 | .22½ | .23 |
| 650, steam refined | .23½ | .24 | .23½ | .24 | .24 | .24½ |
| 600, Pennsylvania Flash | .24½ | .25 | .24½ | .25 | .25 | .26 |
| 630, Pennsylvania Flash | .27½ | .28 | .27½ | .28 | .28 | .29 |
| 600, Warren E | .23½ | .24 | .23½ | .24 | .24 | .24½ |
| 600, Oil City E | .22½ | .23 | .22½ | .23 | .23 | .23½ |
| Light 140-150 Bright Stocks | .30 | .31 | .30 | .31 | .30 | .31 |
| Dark 140-150 Bright Stocks | .29 | .30 | .29 | .30 | .29 | .30 |

## LOS ANGELES EXPORT PRICES

| | Dec. 29 | | Dec. 22 | | Dec. 15 | |
|---|---|---|---|---|---|---|
| Kerosene, water white | .04 | .04¾ | .04 | .04¾ | .04 | .04¾ |
| U. S. Motor gasoline 53-55 e.p. | .04¼ | .04½ | .04¼ | .04½ | .04¼ | .04½ |
| 58-60, 400 endpoint gasoline | .04¾ | .05 | .04¾ | .05 | .04¾ | .05 |

## CRUDE OIL PRICES

### OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

East Texas (Nov. 2, 1931)†.....$ .32
Corsicana heavy (Nov. 2, 1931)*..... .49
Other fields.....See gravity table

†Posted by Panola Pipe Line Co., Magnolia Petroleum Co., Tidal Refining Co., Sinclair Refining Co., Gulf Pipe Line Co., Atlas Pipe Line Co. *Magnolia Petroleum Co.

### EASTERN STATES

**Joseph Seep Purchasing Agency**
(Effective December 16, 1931)

Pennsylvania Grade Oil in National Transit Lines (Bradford Field) (Oct. 15, 1931) .....$1.85
Pennsylvania Grade Oil in Southwest Pennsylvania Lines ..... 1.55
Penna Grade Oil in Eureka Pipe Line Lines (West Virginia) ..... 1.45
Penna Grade Oil in Buckeye Pipe Line Lines ..... 1.25
Corning Grade Oil in Buckeye Pipe Line Co.'s line (Nov. 9, 1931) ..... .85
Ragland Grade Oil in Cumberland Pipe Lines (Kentucky) (Jan. 16, 1931)..... .40
Wayne district Oil in Cumberland Pipe Lines (April 23, 1931) ..... 1.17

**Tide Water Pipe Co.**
(Effective December 16, 1931)

Bradford, Pa. .....$1.85
Allegany, N. Y. ..... 1.85

**Pure Oil Co.**
(Effective December 16, 1931)

Cabin Creek, W. Va. .....$1.45
Bradford Hollow, W. Va. ..... 1.45
Kelly's Creek, W. Va. ..... 1.45

**Pennzoil Co.**
(Effective December 16, 1931)

Pennsylvania Grade Oil in National Transit Lines:
Group A .....$1.80
Includes Cochran, Franklin, Hamilton and Doolittle districts.
Group B .....$1.79
Includes Titusville district.
Group C .....$1.78
Includes Turkey and Tidiout districts.
Group D .....$1.77
Includes Bear Creek and Porkey districts.
Group E .....$1.75
Includes Eidenau, Bull Creek, Rough Run, Carbon, Dipner, Bredin, McJunkin, Jameson, Kennerdell, Emlenton, Tiona, Lacy and Kinzua districts.

Price depends on length of pipe line haul to plant at Oil City.

### TEXAS PANHANDLE

Gray County, Wheeler County and Carson-Hutchinson Counties....See gravity table

### WEST TEXAS

Iatan and Westbrook..Same as North Texas
Crane, Upton, Crockett, Howard, Glasscock, Ector, Winkler and Pecos Counties* .....$ .50
Lea County, N. Mex.‡ ..... .50
Toborg, Pecos County, Aug. 25, 1931†. .25
*The Texas Company, November 2, 1931: Magnolia Petroleum Co., Humble Oil & Refining Co., Gulf Pipe Line Co., same day. †Shell Petroleum Corp. ‡Humble Oil & Refining Co., The Texas Company, November 2, 1931.

### GULF COAST

Grade A and Grade B classifications discontinued by leading buyers.....
.....See gravity table
Jennings, La. (Nov. 2, 1931)*.....$ .65
Lockport, La. (Aug. 27, 1931)†.....
.....See Gulf Coast gravity table
Refugio light.....See gravity table
Refugio heavy (Nov. 2, 1931)‡..... .75
Markham (Nov. 2, 1931)§..... .67
High Island (Nov. 2, 1931)¶..... .65
*Gulf Refining Co. †Vacuum Oil Co. ‡Humble Oil & Refining Co. §The Texas Company. ¶Gulf Pipe Line Co.

### NORTH LOUISIANA AND ARKANSAS

Smackover, Ark. (all grades) (Nov. 4, 1931) .....$ .55
Urhana, Ark. .....See note below
Bellevue, La. (June 2, 1931)..... .25
Urania, La. (Nov. 2, 1931)..... .50
Callon, Ark. (Aug. 22, 1931)..... .52
East El Dorado, Ark. (Nov. 4, 1931).... .55

(Continued on Page 102)

## CRUDE OIL GRAVITY TABLE

| Gravity | 1 Kansas and Oklahoma | 2 North and Central Texas | 3 East Central Texas | 4 Gray County, Texas | 5 Carson and Hutchinson Counties Texas | 6 Salt Creek, Wyo. | 7 North Louisiana and Arkansas | 8 Gulf Coast (Tex. and La.) |
|---|---|---|---|---|---|---|---|---|
| Below 25 degrees | ... | ... | ... | ... | ... | ... | ... | $ .70 |
| 25-25.9 degrees | ... | ... | ... | ... | ... | ... | ... | .71 |
| 26-26.9 degrees | ... | ... | ... | ... | ... | ... | ... | .73 |
| 27-27.9 degrees | ... | ... | ... | ... | ... | ... | ... | .73 |
| 28-28.9 degrees | ... | ... | ... | ... | ... | ... | ... | .74 |
| Below 29 degrees | $ .61 | $ .61 | $ .61 | ... | ... | $ .61 | $ .61 | ... |
| 29-29.9 degrees | .63 | .63 | .63 | ... | ... | .63 | .63 | .75 |
| 30-30.9 degrees | .65 | .65 | .65 | ... | ... | .65 | .65 | .76 |
| 31-31.9 degrees | .67 | .67 | .67 | ... | ... | .67 | .67 | .77 |
| 32-32.9 degrees | .69 | .69 | .69 | ... | ... | .69 | .69 | .78 |
| 33-33.9 degrees | .71 | .71 | .71 | ... | ... | .71 | .71 | .79 |
| 34-34.9 degrees | .73 | .73 | .73 | $ .61 | $ .56 | .73 | .73 | .80 |
| 35-35.9 degrees | .75 | .75 | .75 | .63 | .58 | .75 | .75 | .81 |
| 36-36.9 degrees | .77 | .77 | .77 | .65 | .60 | .77 | .77 | .82 |
| 37-37.9 degrees | .79 | .79 | .79 | .67 | .62 | .79 | .79 | .83 |
| 38-38.9 degrees | .81 | .81 | .81 | .69 | .64 | .79 | .79 | .84 |
| 39-39.9 degrees | .83 | .83 | .83 | .71 | .66 | .79 | .79 | .85 |
| 40 degrees and over | .85 | .85 | .85 | .73 | .68 | .79 | .79 | .86 |

The Magnolia Petroleum Co., which pays a flat price in every field in which it purchases oil, posted the following price notice: "Effective November 2, 1931, at 7 a. m. and until further notice our prices on crude oil will be as follows at the wells: North and North Central Texas, which includes only Burkburnett, Archer, Stephens, Henrietta, Electra, Comanche and Olden, 63 cents; Central Texas, which includes only Mexia, Wortham, Corsicana light, Panola County and Lytton Springs, 79 cents; East Texas district, 83 cents; West Texas, which includes Winkler, Crane, Upton, Howard, Glasscock and Mitchell Counties, 50 cents; Panhandle district of Texas; Gray County, 73 cents; Carson and Hutchinson Counties, 66 cents; Southwest Texas: Mirando, 75 cents; Darst Creek, 60 cents; Corsicana heavy and Luling, 49 cents. Oklahoma: Cushing, Yale, Oklahoma City, Morrison, Wewoka, Seminole, 83 cents; Cement, Duncan and Walters, 75 cents; Hewitt and Graham, 67 cents; Healdton, 52 cents."

The Magnolia Petroleum Co. made the following announcement applying to North Louisiana and Arkansas: "Effective November 4, 1931, at 7 a. m., and until further notice our prices on crude oil in the States of Louisiana and Arkansas will be as follows per barrel at the wells: Louisiana—Bull Bayou, 83 cents; Haynesville, 65 cents; Pine Island, 73 cents; Cotton Valley, 61 cents. Arkansas—El Dorado, 63 cents; Rainbow, 63 cents; El Dorado East Field, 55 cents; Smackover, 55 cents."

The White Eagle Oil Corp., effective November 2, posted the following prices in Kansas: Group 1—Eastborough, Wright, Robbins, Greenwich, Lorena and North Greenwood Pools, 85 cents; Group 2—Eastman, Fox-Bush and Keighly, 83 cents; Group 3—Smock, Sluss, Leon-Weaver, Peabody and Rock, 81 cents; Group 3A—Ritz-Canton, 79 cents; Group 4—Urschell, Florence, Elbing, Nuttle-Koogler, 77 cents; Augusta, 77 cents; Group 5—Gelwick, 61 cents.

Column 1—Led by Continental Oil Co., effective November 2, and adopted by other purchasers on same day, excepting that the Carter Oil Co., Gypsy Oil Co. and Pure Oil Co. started their schedule at below 25 degrees, 53 cents; 25 degrees, 55 cents, with 2 cents added for each degree upward to 40 degrees and above at 85 cents.

Column 2—Led by Continental Oil Co., effective November 2, and followed on same day by other purchasers.

Column 3—Led by Humble Oil & Refining Co., effective November 2.

Column 4—Led by The Texas Company, November 2, followed by Humble Oil & Refining Co., Gulf Pipe Line Co. and H. F. Wilcox Oil & Gas Co. same day.

Column 5—Led by The Texas Company, November 2, followed on same day by Humble Oil & Refining Co. and Gulf Pipe Line Co.

Column 6—Midwest Refining Co., November 2.

Column 7—Standard Oil Co. of Louisiana, November 4, 1931; The Texas Company, Gulf Refining Co. and Louisiana Oil Refining Co. same day.

Column 8—Led by The Texas Company, followed on same day by Humble Oil & Refining Co., Vacuum Oil Co., Gulf Pipe Line Co. and Sun Oil Co., but two last named companies' schedules stop at 35 degrees and above at 81 cents, and the Sinclair Refining Co., but latter company's schedule stops at 31 degrees and above at 71 cents.

## CALIFORNIA CRUDE OIL PRICES

### STANDARD OIL CO. OF CALIFORNIA

For its current purchases of crude oil at the well (unless otherwise specified) the allowable crude oil produced in accordance with allocations made by the California State-wide Curtailment Committee. All gravities above those quoted take highest price offered in that field. Effective June 19, 1931, at 7 a. m.

| Gravity | Signal Hill | Seal Beach, Alamitos Heights | Huntington Beach | Inglewood | Olinda-Brea, Canon | Torrance | Richfield | Coyote Hills | Santa Fe Springs | Midway-Sunset, Elk Hills, Buena Vista Hills | Lost Hills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14-14.9 | $ .65 | $ .65 | $ .65 | $ .65 | $ .65 | $ .65 | $ .65 | $ .65 | ... | $ .55 | $ .55 |
| 15-15.9 | .65 | .65 | .65 | .65 | .65 | .65 | .65 | .65 | ... | .55 | .55 |
| 16-16.9 | .65 | .65 | .65 | .65 | .65 | .65 | .65 | .65 | ... | .55 | .55 |
| 17-17.9 | .65 | .65 | .65 | .65 | .65 | .65 | .65 | .65 | ... | .55 | .55 |
| 18-18.9 | .65 | .65 | .65 | .65 | .65 | .65 | .65 | .65 | ... | .55 | .55 |
| 19-19.9 | .65 | .65 | .65 | .65 | .65 | .65 | .65 | .65 | ... | .55 | .55 |
| 20-20.9 | .65 | .65 | .65 | .66 | .64 | .65 | .65 | .65 | ... | .55 | .55 |
| 21-21.9 | .65 | .65 | .66 | .68 | .67 | .65 | .66 | .65 | ... | .55 | .57 |
| 22-22.9 | .65 | .65 | .66 | .70 | .68 | .66 | .68 | .65 | ... | .56 | .59 |
| 23-23.9 | .67 | .67 | .68 | .72 | .70 | .67 | .70 | .66 | ... | .58 | .60 |
| 24-24.9 | .69 | .69 | .70 | .74 | .72 | .68 | .72 | .67 | $ .65 | .61 | .62 |
| 25-25.9 | .71 | .71 | .72 | .76 | .74 | .70 | .74 | .69 | .65 | .64 | .64 |
| 26-26.9 | .73 | .73 | .74 | ... | .76 | ... | ... | .71 | .65 | .66 | .66 |
| 27-27.9 | .75 | .75 | .76 | ... | .78 | ... | ... | .73 | .68 | .68 | .67 |
| 28 28.9 | .77 | ... | ... | ... | .80 | ... | ... | .75 | .71 | .71 | .69 |
| 29-29.9 | .79 | ... | ... | ... | ... | ... | ... | .77 | .73 | .74 | .71 |
| 30-30.9 | .81 | ... | ... | ... | ... | ... | ... | .79 | .75 | .76 | .73 |
| 31-31.9 | ... | ... | ... | ... | ... | ... | ... | ... | .78 | ... | ... |
| 32-32.9 | ... | ... | ... | ... | ... | ... | ... | ... | .80 | ... | ... |
| 33-33.9 | ... | ... | ... | ... | ... | ... | ... | ... | .83 | ... | ... |
| 34-34.9 | ... | ... | ... | ... | ... | ... | ... | ... | .85 | ... | ... |
| 35-35.9 | ... | ... | ... | ... | ... | ... | ... | ... | .87 | ... | ... |

Standard Oil Co. of California prices in other fields:
Wheeler Ridge—55 cents per barrel for all grades (14° to 35.9°).
Coalinga—55 cents for all grades from 14° to 24-24.9°; 57 cents for 25 gravity.
Newhall, McKittrick and Kern River—55 cents for all grades (14° to 19.9°).
Montebello—65 cents for all grades (14° to 25.9°).
Whittier and LaHabra—65 cents for all grades (14° to 22.9°).
Elwood Terrace, f.o.b. ship—32° to 33.9°, 79 cents; 34° to 34.9°, 81 cents; 35° to 35.9°, 84 cents; 36° and above, 87 cents.
Playa Del Rey—Prices subject to field-gathering charge of 5 cents per barrel—19° to 19.9°, 65 cents; 20° to 20.9°, 65 cents; 21° to 21.9°, 66 cents; 22° to 22.9°, 67 cents, 23° to 23.9°, 68 cents; 24° to 24.9°, 67 cents; 25° and above, 68 cents.

(Continued on Page 108)

# TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Dec. 29

## ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

### NEBRASKA

**Standard Oil Co. (Nebraska)**

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank wagon | Service station | Incl'ds tax of | tank wagon |
| Omaha | 14.9 | 15.9 | 4.0 | 9.25 |
| McCook | 17.0 | 17.0 | 4.0 | 7.5 |
| Norfolk | 16.75 | 17.75 | 4.0 | 9.75 |
| N. Platte | 17.75 | 18.75 | 4.0 | 10.50 |
| Scottsbluff | 17.0 | 17.0 | 4.0 | 9.0 |

Note—Dealers' discount allowed as follows: Red Crown Ethyl, 3 cents off station price; Red Crown, 2½ cents off normal service station price; Nebraska Blue (third grade), 1 cent off normal service station price.

### PACIFIC COAST TERRITORY

**Standard Oil Co. (New Jersey)**

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank truck | Posted wh'l's'e* | Incl'ds tax of | tank wagon |
| Fresno | 12.5 | 16.5 | 3.0 | 17.0 |
| San Francisco | 12.5 | 16.5 | 3.0 | 15.5 |
| Los Angeles | 12.0 | 16.0 | 3.0 | 15.5 |
| Reno, Nev. | 16.5 | 20.5 | 4.0 | 19.0 |
| Portland, Ore. | 14.0 | 18.0 | 4.0 | 16.5 |
| Seattle, Wash. | 15.0 | 19.0 | 5.0 | 16.5 |
| Tacoma | 15.0 | 19.0 | 5.0 | 16.5 |
| Spokane | 18.5 | 22.5 | 5.0 | 20.5 |
| Phoenix, Ariz. | 14.5 | 18.5 | 5.0 | 20.0 |

Above prices are at company's plant or depots as company does not operate stations. A 5-cent per gallon discount is given dealers and customers taking tank wagon lots except in Phoenix where the discount is 3 cents plus a 2-cent special temporary discount subject to withdrawal at any time.

*Retail prices posted by Standard Stations, Inc., a subsidiary.

### NEW YORK AND PART OF NEW ENGLAND DISTRICT

**Standard Oil Co. (New York)**

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank wagon | Service station | Incl'ds tax of | tank wagon |
| Albany, N. Y. | 16.6 | 17.6 | 3.0 | 15.6 |
| New York* | 13.3 | 14.3 | 3.0 | 14.3 |
| Buffalo | 15.8 | 15.8 | 3.0 | 14.8 |
| Rochester | 16.0 | 16.0 | 3.0 | 14.0 |
| Syracuse | 16.8 | 16.8 | 3.0 | 14.8 |
| Boston, Mass. | 16.5 | 16.5 | 3.0 | 13.5 |
| Augusta, Me. | 15.8 | 15.8 | 4.0 | 14.8 |
| Manch'tr, N. H. | 15.4 | 15.4 | 4.0 | 14.0 |
| Burlington, Vt. | 19.3 | 19.3 | 4.0 | 15.3 |

*Prices in steel barrels.

### CENTRAL SOUTH DISTRICT

**Standard Oil Co. (Louisiana)**

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank wagon | Service station | Incl'ds tax of | tank wagon |
| N. Orleans, La. | 14.5 | 14.5 | 6.0 | 12.0 |
| Baton Rouge | 16.5 | 17.0 | 5.0 | 13.0 |
| Alexandria† | 14.5 | 14.5 | 6.0 | 12.0 |
| Lafayette* | 17.5 | 18.0 | 6.0 | 13.0 |
| Lake Charles* | 16.5 | 16.5 | 6.0 | 12.0 |
| Shreveport | 16.5 | 17.0 | 5.0 | 12.0 |
| Knoxville, Tenn. | 21.0 | 21.5 | 7.0 | 13.5 |
| Memphis | 17.0 | 17.0 | 7.0 | 10.0 |
| Chattanooga | 20.5 | 21.0 | 7.0 | 11.0 |
| Nashville | 20.0 | 20.5 | 7.0 | 12.5 |
| Bristol | 20.0 | 21.0 | 7.0 | 14.0 |
| Lt. Rock, Ark. | 17.5 | 18.0 | 6.0 | 11.0 |

*Includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax. New Orleans kerosene price also includes 1-cent city tax.

†Gasoline price at Alexandria includes 1-cent tax in parish of Rapides.

Two-cent discount off gasoline and kerosene tank wagon price to dealer and commercial accounts.

### NAPHTHA

| | Tank wagon | Tank car |
|---|---|---|
| Oleum spirits | 11.7 | 6.0 |
| V.M.P. naphtha | 13.7 | 7.5 |
| Cleaners' naphtha | 15.2 | 9.0 |
| Stanisol | 15.2 | 9.0 |

Tank wagon prices f.o.b. Chicago and Whiting, effective Nov. 6.

### STANOLIND FURNACE OIL IN CHICAGO

Effective July 1, prices f.o.b. Chicago, tank wagon prices: 1 to 99 gallons, 8 cents; 100 gallons or more, 6 cents.

**Stanolax Fuel**

Effective May 9, f.o.b. Chicago, tank wagon prices: 1 to 199 gallons, 7 cents; 200 gallons or more, 5 cents. Sinclair met this by bringing down the price of its No. 2.

**Fuel Oils**

Chicago tank wagon prices (in lots of 400 gallons and over): 38-40 straw distillate, 6 cents; 32-36 gas oil (light zero), 5.5 cents; 32-36 gas oil (industrial), 5.25 cents; 28-30 zero fuel oil, 5 cents; 24-26 fuel oil, 4.25 cents; 18-22 fuel oil, 3.75 cents.

### STANDARD OIL CO. (INDIANA)

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank wagon | Service station | Incl'ds tax of | tank wagon |
| Chicago | 15.0 | 15.0 | 3.0 | 9.0 |
| Decatur, Ill. | 15.4 | 15.4 | 3.0 | 9.0 |
| E. St. Louis | 14.7 | 14.7 | 3.0 | 8.2 |
| Joliet | 15.4 | 15.4 | 3.0 | 9.0 |
| Peoria | 15.4 | 14.0 | 3.0 | 9.0 |
| Quincy | 15.2 | 15.2 | 3.0 | 8.8 |
| Davenport, Ia. | 15.5 | 12.9 | 3.0 | 9.3 |
| Des Moines | 12.9 | 12.9 | 3.0 | 8.0 |
| Keokuk | 15.5 | 15.5 | 3.0 | 8.3 |
| Sioux City | 15.1 | 15.1 | 3.0 | 8.9 |
| Duluth, Minn. | 16.5 | 16.5 | 3.0 | 9.0 |
| Mankato | 16.1 | 16.1 | 3.0 | 8.9 |
| Minneapolis | 14.4 | 14.4 | 3.0 | 9.9 |
| LaCross, Wis. | 17.2 | 17.2 | 4.0 | 10.0 |
| Milwaukee | 16.1 | 16.1 | 4.0 | 8.9 |
| Madison | 16.2 | 16.2 | 4.0 | 9.1 |
| Detroit, Mich. | 14.5 | 14.5 | 3.0 | 10.7 |
| Grand Rapids | 15.7 | 15.7 | 3.0 | 10.6 |
| Saginaw | 14.6 | 14.6 | 3.0 | 10.5 |
| Evansville, Ind. | 16.1 | 16.1 | 4.0 | 9.9 |
| Indianapolis | 16.3 | 16.3 | 4.0 | 10.1 |
| South Bend | 16.4 | 16.4 | 4.0 | 8.0 |
| Fargo, N. D. | 17.9 | 17.9 | 3.0 | 11.9 |
| Huron, S. D. | 17.3 | 17.3 | 4.0 | 10.7 |
| Sioux Falls | 16.8 | 16.8 | 4.0 | 10.4 |
| K. C., Mo. | 14.9 | 14.9 | 3.0 | 7.6 |
| Springfield* | 14.9 | 14.9 | 3.0 | 8.5 |
| St. Louis* | 13.9 | 13.9 | 3.5 | 8.3 |
| St. Joseph | 10.4 | 10.4 | 3.0 | 7.5 |
| Wichita, Kans. | 13.8 | 13.8 | 3.0 | 6.0 |
| Bartlesville, Okla. | 14.0 | 16.0 | 5.0 | 7.0 |

*State tax 2 cents, remainder city tax.

A third grade of gasoline, "Stanolind Blue," is sold at all major points at a price 1½ cents or more below the price on the regular grade.

Effective November 4—New dump discount applicable on all grades of gasoline sold from tank wagon. Any tank wagon customer buying 25 gallons or more at one time will be given 1-cent discount per gallon off tank wagon price at time of delivery. Customers not under contract receive no other discount.

Effective April 15—Discounts on Q.D.A. on 1,000 gallons or more per month throughout territory; Red Crown Ethyl Gasoline, 3 cents off tank wagon price; Red Crown gasoline, 2½ cents off tank wagon price; Stanolind Blue gasoline, 1 cent off tank wagon price. On deliveries of 75,000 gallons or more each classification allowed 1 cent additional discount.

Discounts on resellers authorized agent's agreement: Same amounts as above except made off service station price instead of tank wagon price.

### SOUTHWESTERN DISTRICT

**Magnolia Petroleum Co.**

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank wagon | Service station | Incl'ds tax of | tank wagon |
| Dallas, Tex. | 15.0 | 16.0 | 4.0 | 8.0 |
| Fort Worth | 15.0 | 16.0 | 4.0 | 7.0 |
| Houston | 14.0 | 16.0 | 4.0 | 8.0 |
| San Antonio | 14.0 | 16.0 | 4.0 | 7.0 |
| El Paso | 16.0 | 18.0 | 4.0 | 10.0 |
| Texarkana | 14.0 | 16.0 | 4.0 | 8.0 |
| Muskogee, Okla. | 13.0 | 14.0 | 5.0 | 6.0 |
| Okla. City | 15.0 | 17.0 | 5.0 | 7.0 |
| Tulsa | 15.0 | 17.0 | 6.0 | 8.0 |
| Ft. Smith, Ark. | *17.5 | 18.0 | 5.0 | *11.0 |
| Little Rock | *18.5 | 18.0 | 6.0 | *11.0 |

One-cent rebate made from posted station prices to cash purchasers in Louisiana, Arkansas and Tennessee.

*Less 2 cents to dealers.

### ROCKY MOUNTAIN DISTRICT

**Continental Oil Co.**

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank wagon | Service station | Incl'ds tax of | tank wagon |
| Denver, Colo. | 12.0 | 15.0 | 4.0 | 12.5 |
| Pueblo | 12.0 | 15.0 | 4.0 | 12.0 |
| Grand Jctn. | 13.0 | 21.0 | 4.0 | 14.5 |
| Casper, Wyo. | 15.0 | 18.0 | 4.0 | 10.0 |
| Cheyenne | †14.0 | 14.0 | 4.0 | 11.5 |
| Butte, Mont. | 17.0 | 20.0 | 5.0 | 16.0 |
| Billings | 20.0 | 23.0 | 5.0 | 14.5 |
| Great Falls | 21.0 | 23.0 | 5.0 | 16.0 |
| Helena | 21.0 | 24.0 | 5.0 | 16.0 |
| Salt Lake, Utah | 17.5 | 20.5 | 4.0 | 16.0 |
| Albu'que, N. M. | 18.0 | 21.0 | 6.0 | 14.0 |
| Boise, Idaho | 21.0 | 24.0 | 5.0 | 18.0 |
| Twin Falls* | 20.5 | 20.0 | 5.0 | 18.0 |

*2½-cent discount off tank wagon to dealers.

†3-cent discount off tank wagon to dealers.

### OHIO

**Standard Oil Co. (Ohio)**

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank wagon | Service station | Incl'ds tax of | tank wagon |
| Ohio points | 15.0 | 16.0 | 4.0 | *12.0 |

Dealers and commercial accounts 2 cents under tank wagon.

*Service station price 13 cents.

### PENNSYLVANIA-DELAWARE AND PART OF NEW ENGLAND

**Atlantic Refining Co.**

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank wagon | Service station | Incl'ds tax of | tank wagon |
| Pittsburgh, Pa. | 15.0 | 16.0 | 3.0 | 11.0 |
| Philadelphia | 14.0 | 15.0 | 3.0 | 11.0 |
| Scranton | 15.0 | 16.0 | 3.0 | 11.0 |
| Allentown | 15.0 | 16.0 | 3.0 | 11.0 |
| Altoona | 15.0 | 16.0 | 3.0 | 11.0 |
| Erie | 15.0 | 16.0 | 3.0 | 11.0 |
| Dover, Del. | 15.0 | 16.0 | 3.0 | 11.0 |
| Wilmington | 15.0 | 16.0 | 3.0 | 11.0 |
| Springf'd, Mass. | 14.5 | 15.5 | 3.0 | 10.0 |
| Worcester | 14.3 | 15.3 | 3.0 | 8.5 |
| Boston | 13.5 | 14.5 | 3.0 | 10.0 |
| Providence, R.I. | 11.5 | 12.5 | 2.0 | 8.5 |
| Hartford, Conn. | 14.5 | 15.5 | 2.0 | 10.0 |
| New Haven | 14.6 | 15.6 | 3.0 | 10.0 |

### SOUTHERN DISTRICT

**Standard Oil Co. (Kentucky)**

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank wagon | Service station | Incl'ds tax of | tank wagon |
| Atlanta, Ga.* | 19.0 | 19.0 | 6.0 | 12.5 |
| Augusta | 20.0 | 21.0 | 6.0 | 14.0 |
| Macon | 20.0 | 20.0 | 6.0 | 12.5 |
| Savannah | 19.0 | 19.0 | 6.0 | 13.0 |
| Birm'ham, Ala. | 19.0 | 19.0 | 6.0 | 10.0 |
| Mobile | 17.5 | 17.5 | 5.0 | 10.0 |
| Montgomery | 21.0 | 20.5 | 6.0 | 13.5 |
| Jackson, Miss. | 16.5 | 16.5 | 5.5 | 11.5 |
| Vicksburg | 18.0 | 18.0 | 5.5 | 8.0 |
| Jack'ville, Fla. | 20.0 | 21.0 | 7.0 | 11.0 |
| Miami | 21.0 | 22.0 | 7.0 | 13.0 |
| Pensacola | 20.0 | 20.0 | 7.0 | 13.0 |
| Tampa | 20.0 | 20.0 | 7.0 | 12.0 |
| Lexington, Ky. | 17.0 | 18.0 | 5.0 | 12.0 |
| Covington | 18.0 | 19.0 | 5.0 | 12.0 |
| Louisville | 16.0 | 17.0 | 5.0 | 11.0 |
| Corbin | 18.0 | 19.0 | 5.0 | 15.0 |

A third grade "Kyso Green," is sold at a price generally 2 cents below the price on the regular grade.

In addition to the state tax of 4 cents on gasoline, Montgomery has city and county tax of 2 cents on gasoline and one-half cent on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene and one-fourth cent on gasoline. To Pensacola, Montgomery and Birmingham state taxes add 1-cent levy tax. To Gulfport state tax add privilege tax of 2 cents. To Mobile state tax add 1-cent city tax and 2½ cents county tax.

Effective April 2 price to dealers 2 cents under posted tank wagon price.

*An additional discount of 1 cent is offered to dealers here effective October 6.

### ATLANTIC COAST DISTRICT

**Standard Oil Co. (New Jersey)**

| | Gasoline | | | Kero. |
|---|---|---|---|---|
| | Tank wagon | Service station | Incl'ds tax of | tank wagon |
| Atl'tic City, N.J. | 15.7 | 16.7 | 3.0 | 11.5 |
| Newark | 14.7 | 15.7 | 3.0 | 10.5 |
| Annapolis, Md. | 16.2 | 17.2 | 4.0 | 10.0 |
| Baltimore | 15.4 | 16.4 | 4.0 | 8.0 |
| Cumberland | 17.2 | 18.2 | 4.0 | 12.0 |
| Wash'g'n, D. C. | 13.9 | 14.9 | 2.0 | 10.7 |
| Danville, Va. | 18.0 | 19.0 | 5.0 | 11.5 |
| Norfolk | 16.5 | 17.5 | 5.0 | 10.3 |
| Petersburg | 17.5 | 18.5 | 5.0 | 11.3 |
| Richmond | 16.5 | 15.5 | 5.0 | 10.7 |
| Roanoke | 17.7 | 16.7 | 5.0 | 12.0 |
| Charles'n, W.Va. | 16.7 | 17.7 | 4.0 | 11.5 |
| Keyser | 17.3 | 18.3 | 4.0 | 12.1 |
| Parkersburg | 15.4 | 16.4 | 4.0 | 10.2 |
| Wheeling | 16.6 | 17.6 | 4.0 | 11.4 |
| Charlotte, N. C. | 17.5 | 17.0 | 6.0 | 10.7 |
| Hickory | 19.3 | 20.3 | 6.0 | 12.6 |
| Mt. Airy | 19.7 | 20.7 | 6.0 | 13.5 |
| Raleigh | 19.4 | 20.4 | 6.0 | 12.2 |
| Salisbury | 19.7 | 20.7 | 6.0 | 13.5 |
| Charleston, S.C. | 17.5 | 18.5 | 6.0 | 10.3 |
| Columbia | 19.4 | 20.4 | 6.0 | 13.2 |
| Spartanburg | 19.7 | 20.7 | 6.0 | 13.5 |

Two cents per gallon discount off retail tank wagon price of gasoline to dealers except Washington, D. C., and States of Maryland and New Jersey, where discount is 3 cents.

## TANK WAGON CHANGES

Atlantic Refining Co., effective December 18, reduced kerosene price to 8.5 cents at Worcester, Mass.

Standard Oil Co. of Louisiana, effective December 20, advanced gasoline tank wagon and service station prices 1 cent in Tennessee due to increase in state tax from 6 to 7 cents.

Standard Oil Co. of New Jersey reduced the gasoline tank wagon and sta-

(Continued on Page 111)

## CRUDE OIL PRICES

(Continued from Page 101)

| | |
|---|---|
| Stephens, Ark., below 29° (Aug. 24, 1931) | .61 |
| Stephens, Ark., 29° and above (Aug. 24, 1931) | .44 |
| Other fields | See gravity table |

Note—Smackover, all grades, Standard Oil Co. of Louisiana, The Texas Company, Gulf Refining Co., Magnolia Petroleum Co. Bellevue posted by Magnolia Petroleum Co.; Urania by H. L. Hunt, Inc., and Louisiana Oil Refining Co.; Calion by Gulf Refining Co.; East El Dorado by Gulf Refining Co. and Magnolia Petroleum Co.; Stephens, Ark., by Louisiana Oil Refining Co. and Atlantic Oil Producing Co.

### SOUTH CENTRAL AND SOUTHWEST TEXAS

| | |
|---|---|
| Darst Creek (Nov. 2, 1931)‡ | $ .64 |
| Luling (Nov. 2, 1931)† | .49 |
| Mirando (Nov. 2, 1931)† | .71 |
| Pettus (Nov. 2, 1931)* | .35 |
| Salt Flat (Nov. 2, 1931)* | .60 |
| Thrall‖ | |
| Lytton Springs (Lockhart). See gravity table | |
| Dobrowolski‖ | |
| Same as Mid-Continent gravity scale up to and including 38-38.9°. | |
| Somerset‖ | |
| Same as Mid-Continent gravity scale up to and including 38-38.9°. | |

‡The Texas Company. *Humble Oil & Refining Co. †Magnolia Petroleum Co. ‖Thrall prices same as North Central Texas less 19¼ cents per cwt. freight. ‖Grayburg Oil & Refining Co., Pioneer Oil & Refining Co. and Texas Petroleum Products. ‖Pioneer Oil & Refining Co.

### ROCKY MOUNTAIN STATES

**Ohio Oil Co.-Midwest Refining Co.**

| | |
|---|---|
| Iles, light (Aug. 24, 1931) | $ .75 |
| Iles, heavy (Aug. 24, 1931) | .53 |
| Fort Collins (Nov. 3, 1931) | .71 |
| Florence (Nov. 2, 1931) | .65 |
| Wellington (Nov. 3, 1931) | .61 |
| Dutton Creek (Nov. 2, 1931) | .75 |
| Rock Creek, Wyo. (Nov. 3, 1931) | .55 |
| Frannie, light (Nov. 3, 1931) | .61 |
| Frannie, heavy (Nov. 3, 1931) | .51 |
| Salt Creek | Mid-Continent gravity table |
| Big Muddy (Nov. 3, 1931) | .83 |
| Grass Creek (Nov. 3, 1931) | 1.05 |
| Elk Basin (Nov. 3, 1931) | 1.05 |
| Lance Creek (Aug. 24, 1931) | 1.05 |
| Poison Spider (Mar. 5, 1931) | .70 |
| Notches (Mar. 14, 1927) | .45 |
| Hudson (June 2, 1931) | .45 |
| Lander (Mar. 5, 1931) | .40 |
| Rex Lake (Feb. 22, 1930) | 1.10 |
| Osage (Apr. 15, 1931) | .93 |
| Lost Soldier (Nov. 3, 1931) | .69 |
| Hamilton Dome (Nov. 3, 1931) | .45 |
| Greybull (Nov. 3, 1931) | 1.05 |
| Cat Creek (Nov. 3, 1931) | 1.05 |
| Pondera (Nov. 3, 1931) | .90 |
| Sunburst, Mont. (Nov. 3, 1931) | 1.00 |
| Hogback, N. Mex. (Aug. 24, 1931) | .85 |
| Lea County, N. Mex. (Nov. 3, 1931) | .55 |
| Border, Mont. | 1.55 |
| Red Coulee, Alberta | 1.55 |
| Dry Creek, Mont. (Aug. 24, 1931) | 1.00 |
| Maljamar (Aug. 22, 1931) | 1.00 |
| Artesia-Jackson (Nov. 3, 1931) | .50 |

Note—Salt Creek, Cat Creek, Dry Creek Dallas-Derby, Hudson, Greybull and Hogback posted by Midwest Refining Co. and remainder by Ohio Oil Co. Both companies posted Grass Creek light and Elk Basin. Lost Soldier posted by Producers & Refiners Corp. Artesia, Jackson and Maljamar posted by Continental Oil Co. Border and Red Coulee posted by Imperial Refining Co. Lea County posted by Humble Oil & Refining Co. Fort Collins, Wellington, Orchard, Florence, Rattlesnake and Table Mesa by Continental Oil Co. Osage posted by Arro Oil & Refining Co.

### MIDDLE WESTERN STATES

**Ohio Oil Co.**

(Effective November 3, 1931)

| | |
|---|---|
| Lima | $1.00 |
| Wooster | 1.15 |
| Illinois | .95 |
| Indiana | .60 |
| Princeton | .95 |
| Plymouth | Shut in |
| Western Kentucky | .90 |
| Midland, Mich. (Oct. 3, 1931)* | .51 |
| Dundee, Mich.† | |
| Same as Stanolind Crude Oil Purchasing Co.'s Mid-Continent gravity scale | |
| Upper and Lower Traverse Sands, Mich.† | |
| Same as Mid-Continent gravity scale | |
| Somerset, Ky. (Nov. 4, 1931) | .30 |
| Hart County, Ky. (Nov. 1, 1931)‖ | .60 |

*Posted by Pure Oil Co. †Posted by Standard of Indiana for boat shipment. ‖Posted by Stoll Refining Co. Somerset, Ky., crude purchased by Ashland Refining Co., Ashland, Ky., and delivered through its own pipe line.

### MEXICO

| | |
|---|---|
| Panuco* | $ .40 |

*F.o.b. ship, based on October transactions and exclusive of production and export taxes and bar dues.

### CANADA

| | |
|---|---|
| Ontario (Nov. 3, 1931): | |
| Petrolia* | $1.99 |
| Oil Springs* | 1.97 |
| Alberta (Aug. 24, 1931): | |
| Turner Valley†: | |
| Crude oil 45-45.9 | 2.00 |
| Crude oil 50 and above | 2.65 |
| Crude naphtha | 2.12 |
| Discolored naphtha | 2.85 |

*Imperial Oil, Ltd. †Imperial Oil, Ltd. and Regal Oil & Refining Co.

# Of Interest to Sales Departments

## Car Output First 10 Months 72 Per Cent of Last Year

Production of automobiles the first 10 months of this year totaled 1,754,748, which was 72 per cent of the 2,436,859 total for the first 10 months of 1930, according to data compiled by Dow, Jones & Co. Only four cars—Pontiac, Plymouth, Willys and Auburn—showed a greater production in 1931 than in 1930.

As in the previous year, Chevrolet and Ford accounted for more than 50 per cent of the car production the first 10 months of this year, the two companies totaling more than 1,000,000 cars. The following table shows the production of cars for the first 10 months of 1931 and 1930:

| | 10 months— | | Pctge., |
|---|---|---|---|
| Gen. Motors Corp.: | 1931 | 1930 | '31 of '30 |
| Buick | 78,992 | 111,609 | 70.77 |
| Cadillac | 9,986 | 10,302 | 96.93 |
| Chevrolet | 534,702 | 566,606 | 94.37 |
| LaSalle | 6,246 | 10,363 | 60.27 |
| Oakland | 12,103 | 20,537 | 58.93 |
| Oldsmobile | 43,848 | 45,551 | 96.26 |
| Pontiac | 68,079 | 64,424 | 105.67 |
| Viking | 344 | 2,539 | 13.55 |
| Total | 754,300 | 831,931 | 90.67 |
| Ford Motor Co.: | | | |
| Ford | 494,853 | 992,362 | 49.86 |
| Lincoln | 3,178 | 3,956 | 80.33 |
| Total | 498,031 | 996,318 | 49.98 |
| Chrysler Corp.: | | | |
| Chrysler | 49,104 | 56,453 | 96.93 |
| DeSoto | 25,756 | 32,846 | 78.41 |
| Dodge | 49,680 | 59,027 | 84.16 |
| Plymouth | 81,963 | 59,567 | 137.59 |
| Total | 206,503 | 207,893 | 99.33 |
| Hudson Motor Car Co.: | | | |
| Essex | 40,089 | 58,704 | 68.29 |
| Hudson | 17,958 | 28,314 | 63.42 |
| Total | 58,047 | 87,013 | 66.70 |
| Willys-Overland Co.: | | | |
| Whippet | 4,306 | 17,863 | 24.09 |
| Willys | 34,189 | 30,157 | 113.37 |
| Willys-Knight | 7,677 | 12,951 | 59.28 |
| Total | 46,172 | 60,976 | 75.72 |
| Auburn Automobile Co.: | | | |
| Auburn | 28,104 | 10,281 | 273.36 |
| Cord | 1,267 | 1,759 | 72.03 |
| Total | 29,371 | 12,040 | 243.94 |
| Studebaker Corp.: | | | |
| Studebaker | 41,659 | 51,647 | 80.66 |
| Pierce-Arrow | 4,056 | 6,114 | 66.34 |
| Total | 45,715 | 57,761 | 79.14 |
| Nash | 36,444 | 45,535 | 80.03 |
| Graham | 17,651 | 28,162 | 62.67 |
| Hupp | 16,011 | 22,923 | 69.84 |
| Packard | 14,765 | 25,987 | 56.81 |
| Durant | 6,781 | 20,126 | 33.68 |
| Reo | 6,026 | 9,814 | 61.46 |
| Marmon | 5,263 | 11,210 | 46.94 |
| DeVaux | 4,315 | (*) | |
| Franklin | 3,267 | 6,769 | 48.26 |
| Austin | 2,800 | 3,676 | 76.17 |
| Peerless | 1,184 | 3,601 | 32.88 |
| Stutz | 383 | 743 | 51.54 |
| Miscellaneous | 1,719 | 4,375 | 39.29 |
| Total | 1,754,748 | 2,436,859 | 72.00 |

*Not in production.

### RILEY FIGHTS TAX DIVERSION

SACRAMENTO, Calif., Dec. 26.—State Controller Ray Riley opposes diversion of state gasoline taxes from highway purposes to the state general fund and looks with disfavor on use of gasoline taxes to retire old highway bond issues. His statement was the latest in the gasoline tax controversy between State Finance Director Rolland A. Vandegrift and Senator Arthur H. Breed of Piedmont. If the State is collecting more gasoline taxes than it needs for road building, it should reduce the tax, Mr. Riley says, or turn over the surplus for county highway work.

### GASOLINE TAX INCREASE

CHATHAM, Ontario, Dec. 26.—It is unofficially reported that the provinces of Ontario and Quebec will both take action in 1932 to increase the gasoline tax from 5 to 6 cents per imperial gallon.

## CANADIAN CONSUMPTION 387 GALLONS PER CAR

CHATHAM, Ontario, Dec. 26.—Figures recently issued by the Dominion Bureau of Statistics at Ottawa show that in 1930 the average gasoline consumption per registered motor vehicle in Canada was 387 gallons. This figure, however, does not make allowance for gasoline purchased by United States tourists, which would slightly reduce the average.

In 1930 the total consumption of gasoline by motor vehicles in Canada amounted to 479,554,392 gallons, being approximately 3,000,000 gallons less than 1929, or a decrease of .7 per cent. This decrease was due to the curtailed use of motor cars in western Canada, particularly Saskatchewan, where consumption per motor vehicle dropped 32 per cent, and in Alberta where the decrease was 24 per cent.

Eastern Canada showed increases in consumption. Ontario consumption rose to 239,058,108 gallons, an increase of nearly 10,000,000 gallons and an average of 423 gallons. In Quebec the average was highest, 465 gallons, with an increase of over 12,500,000 gallons and total consumption of 83,231,268 gallons. The largest gain was in New Brunswick where the total of 13,982,400 gallons was 40 per cent above the previous year's figures.

The average consumption per car is substantially less in Canada than in the United States. This is largely due to the colder climate of Canada, many motor vehicles not operating during the winter months.

## ALL RUMANIAN GASOLINE HANDLED BY BALTIMORE

NEW YORK, Dec. 26.—All of the Rumanian gasoline shipped to Detroit, Mich., from Constanza will be handled through the Seaboard terminal in Baltimore, Md., according to advices received here. In addition to the Ranja cargo of 3,000,000 gallons, which was the second cargo of Rumanian gasoline received at Baltimore for shipment to Detroit by tank car, several more cargoes of the Rumanian motor fuel are reported to be scheduled.

An analysis of the Rumanian gasoline which reached Baltimore on the Arcola recently showed the following:

| | |
|---|---|
| Gravity | 60.1° B., A.P.I. |
| Boiling point | 97°F. |
| 10% dist. | 142 |
| 100% dist. | 174 |
| 30% dist. | 207 |
| 35% dist. | 223 |
| 50% dist. | 264 |
| 60% dist. | 285 |
| 65% dist. | 294 |
| 80% dist. | 322 |
| 90% dist. | 345 |
| Endpoint | 380 |
| Recovered | 97% |
| Residue | 1.1% |
| Loss | 1.9 |

The gasoline tested 65 octane number and was slightly off color.

### HIGH TAX MAY STOP PROJECT

CHESTER, Pa., Dec. 26.—The proposal to increase the state gasoline tax has prompted suspension of a $2,000,000 improvement project by the Sun Oil Co., of Marcus Hook, J. Howard Pew, president, said. John J. Pugh, president of the Sun Shipbuilding & Drydock Co., and a director of the Sun Oil Co., said the proposed increase in the tax "constitutes a grave menace to the Pennsylvania petroleum industry." "Briefly stated," he said, "the loss of this work for the company would mean from $600,000 to $675,000 taken from the pay envelopes of Delaware County workers."

## DEMAND IN CALIFORNIA DECLINES IN NOVEMBER

Consumption of gasoline in California during November decreased when compared with the October total and also in comparison with the total for November of last year, according to state reports. In November, the 3-cent state tax was collected on 109,552,457 gallons, the collections totaling $3,253,708, which compares with $3,374,836 for October. It is estimated that the November total was 2.2 per cent less than November, 1930.

The Standard of California, with approximately 20 per cent of the November total, leads all other companies in gasoline sales. The Shell Oil Co. of California, Associated Oil Co., Union Oil Co. and the General Petroleum Corp. follow in the order named. The Richfield Oil Co. is sixth and the Rio Grande Oil Co. seventh. These companies have approximately 75 per cent of the total in the state. The following report gives the gasoline gallonage for November by companies:

| | |
|---|---|
| Bell, H. H. (Kettleman Hills Gasoline Co.) | 534,426 |
| Associated Oil Co. | 11,156,577 |
| Bush, R. R. | 613,643 |
| Caminol Co., Ltd. | 1,769,895 |
| Champion Oil & Ref. Co., Ltd. | 746,802 |
| Edington-Witz Ref. Co., Ltd. | 727,303 |
| Estado Petroleum Corp., Ltd. | 1,174,134 |
| Exeter Oil Co., Ltd. | 806,953 |
| Fourl, Chas. W. | 764,163 |
| General Pet. Corp. | 8,129,110 |
| Hancock Oil Co. | 2,596,972 |
| Lakeview Oil & Ref. Co. | 305,764 |
| Macmillan Pet. Corp. | 1,095,956 |
| McDuffie, William C., receiver, Richfield Oil Co. of Calif. | 7,342,337 |
| Norwalk Co., The | 924,471 |
| Palisades Oil & Ref. Co., Ltd. | 785,372 |
| Pauley, E. L., receiver, Hercules Gasoline Co., Ltd. | 573,266 |
| Petrol Corp., The | 1,398,112 |
| Rio Grande Oil Co. | 6,488,639 |
| Rolapp, F. H., receiver, Sunset Pacific Oil Co. | 1,037,693 |
| Seaside Oil Co. | 1,142,482 |
| Shell Oil Co. | 13,082,686 |
| Signal Oil & Gas Co. of Calif. | 2,545,263 |
| Standard Oil Co. of Calif. | 21,435,259 |
| St. Helens Pet. Co., Ltd., The | 792,305 |
| Texas Co., The (California) | 3,575,757 |
| Union Oil Co. of Calif. | 8,284,674 |
| Union Pacific Oil Co. | 441,457 |
| Western Oil & Ref. Co. | 2,211,110 |
| Wilshire Oil Co., Inc. | 5,752,646 |
| Wm. P. Andrews Oil Co. | 527,945 |

### TENNESSEE MAY RAISE TAX

NASHVILLE, Tenn., Dec. 26.—An increase from 6 to 7 cents in Tennessee's tax on each gallon of gasoline is proposed in a bill introduced in the legislature. The additional revenue would go into a sinking fund to pay interest on and retire a proposed $10,000,000 bond issue, proceeds of which would be used to cover a deficit in governmental running expenses.

### QUEBEC TO INCREASE TAX

J. E. Perreault, provincial minister of roads and mines, has announced it to be the intention of the Quebec government to increase the gasoline tax act from 5 to 6 cents a gallon. Provision for the increase is contained in a bill introduced in the legislative assembly. It was estimated the increase would net the provisional treasury an increased revenue of approximately $2,000,000 a year.

### HUGHES MOVES OFFICES

CHICAGO, Dec. 30.—Hughes Oil Co., operators of Old Dutch refinery at Muskegon, Mich., and Chicago district oil distributors, move to larger quarters today, on the twenty-ninth floor of the LaSalle-Wacker Building, 121 W. Wacker Drive. Offices of the company have been at 844 Rush Street. Ernest L. Hughes is president, Lawrence G. Halberg is vice president in charge of resale operations, and Charles P. Hirth is vice president in charge of tank car sales.

## Explain Necessity Seasonal Changes in Quality of Gasoline

NEW YORK, Dec. 28.—Shell refineries make a practice of balancing their gasoline to suit the weather conditions prevailing at the time the motor fuel is to be consumed, says Shell Eastern Petroleum Products, Inc., in the current issue of "The Sign of The Shell."

"The extent to which weather changes affect the performance of gasoline in automobile engines is not generally understood by the majority of motorists," says the company. "They are often quite unaware of the fact that gasoline specifications are altered and varied by Shell engineers to suit the varying temperature of summer and winter and also to conform to different altitudes. This relationship between gasoline specifications and temperature and atmospheric pressure is an all-important factor to the petroleum technologist in his study of refining good gasolines.

"For some years past, Shell technical staffs have made a very thorough study of balancing gasoline, not only to suit the weather, but also the varying geographical characteristics of the country where the gasoline is sold.

"As cold weather approaches there is, of course, the obvious necessity for improving the quick-starting properties so that the engine will start with the first few revolutions of the starter. This change in the gasoline cannot be made all at one time, as the temperature change from midsummer to midwinter is gradual and, therefore, the change in the gasoline specifications must also be gradual. The gasoline suitable for temperatures of say 60° F. is not suitable for 40° F. or below, and 75° F. and above. The reason is that a too-volatile gasoline suitable for cold weather will have a tendency to vaporize too readily and cause 'gas lock' if used at the higher temperatures. The result of this gas formation will be stalling of the engine, particularly at traffic lights and elsewhere where the car has to be brought to a stop.

"This 'gas lock' is the result of liquid gasoline changing to vapor in the fuel line, fuel pump or carburetor. The purpose of a carburetor is to mix air with liquid gasoline and thus break it up into mist. It can be readily understood that if the volume of the carburetor chamber is filled with vapor and this in turn is mixed with air, the cylinders are cheated

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### BUYS RUSSIAN GASOLINE

NEW YORK, Dec. 26.—Iuyamtorg, the South American trade organization operated by the Soviet, has "virtually concluded" an arrangement to sell the Uruguayan government 20,000 tons of gasoline at $16.50 per ton and 10,000 tons of kerosene at $14 per ton, according to Associated Press reports from Montevideo. These prices figure out at approximately 4.58 cents per gallon for the gasoline and 3.9 cents per gallon for the kerosene.

Both shipments, according to the A.P. dispatch, would reach Uruguay in June, 1932. The quantity of gasoline involved represents about 25 per cent of Uruguay's annual gasoline consumption and the kerosene about 30 per cent. The gasoline will be sold by the government at prevailing prices charged by private marketers, and a substantial profit is looked for from the sale of the kerosene.

Iuyamtorg, under the terms of the contract, agrees to receive Uruguayan products in payment for the oil up to 25 per cent of the sale price.

# Oil Securities Thoroughly Deflated

## Unusually Heavy Liquidation of "Blue Chips" Brings New Lows. Traders Look for Recovery With Favorable Last Quarter Reports

NEW YORK, Dec. 28.—The market for oil securities closes the year 1931 with stocks and bonds of representative oil companies at levels that indicate not only thorough deflation of the oil industry's securities, but drastic overdeflation on many of the leading issues.

The precipitate downward movement which the market has witnessed during the closing month of the year has been due to unusually extensive liquidation, due to forced selling in many instances. This virtual dumping overboard of oil company securities has not taken into consideration either present conditions or prospects, but has been distressed liquidation in every sense of the word, although some part of the months' selling was undoubtedly to sales to establish losses for income tax purposes. Both the "blue chips" in the oil group, as well as the numerous smaller units generally grouped under the designation of "independents," have been involved.

The extent to which the market has been deflated during the entire year is shown by the following comparisons of highs and lows for a number of representative companies, with comparisons for the previous two years, which takes in the end of the 1929 bull market:

| Stock— | 1931 High | 1931 Low | 1929 High | 1929 Low |
|---|---|---|---|---|
| Atlantic Refining | 23⅝ | 8⅜ | 77⅛ | 30 |
| Buckeye Pipe Line | 56 | 33 | 74½ | 56 |
| Chesebrough Mfg. | 129½ | 75 | 210 | 130 |
| Continental Oil | 12 | 5 | 37⅝ | 18 |
| Humble Oil & Ref. | 72 | 46⅝ | 128 | 74½ |
| Imperial Oil | 18¼ | 7⅝ | 119½ | 88 |
| National Transit | 17⅛ | 5 | 26⅝ | 10⅛ |
| Ohio Oil | 19⅛ | 5 | 79⅛ | 64 |
| Prairie O. & G. | 20⅝ | 5 | 65⅝ | 46⅛ |
| S. O. California | 51⅜ | 23⅝ | 81⅜ | 51⅛ |
| S. O. Indiana | 33⅛ | 14⅛ | 63 | 45 |
| S. O. Kentucky | 23⅝ | 12⅝ | 46⅝ | 29 |
| S. O. N. J. | 52⅛ | 26⅝ | 83 | 48 |
| Sinclair | 16⅝ | 4⅛ | 45 | 21 |
| Shell Union | 10¼ | 3 | 31⅝ | 19 |
| Skelly Oil | 12⅜ | 2⅛ | 46½ | 24 |
| Texas Corp. | 36¼ | 9⅝ | 71⅞ | 50 |
| Tide Water-Asso. | 9 | 2¼ | 23½ | 10 |
| Union Oil of Cal. | 25⅝ | 11 | 57 | 42⅛ |

The above stocks, taken at random from the list, are thoroughly representative of the protracted period of deflation in oil securities, which has taken many hundreds of millions of dollars from the market value of the securities of various oil companies.

While the market has been going into new low ground steadily during the greater part of December, the oils, possibly because of their overdeflated position, have been coming in for closer attention by traders, and there is a possibility that petroleum securities will be in the van of the market recovery when it develops.

Oil stocks, as a group, did not share fully in the sensational bull markets of 1928 and 1929, which carried stock prices to all-time highs. Fundamental conditions in the oil industry now, however, are on a generally firm footing, and the outlook for recovery in earnings in 1932 is regarded so favorably in many quarters that it is felt that when "operations for the rise" are resumed in the stock market, the oils will come in for considerable attention.

Earnings reports for the closing quarter, which will start making their appearance, are expected in many instances to disclose a much more favorable showing for the full year 1931 than has evidently been looked for in certain quarters of the market.

### Pipe Lines Active

"Total deliveries of several of the Standard Oil pipe line companies for November continued to show improvement as compared with November a year ago," Carl H. Pforzheimer & Co. point out. "Buckeye Pipe Line reported 3,020,525 bbls. against 2,323,660 bbls. in November last year. South West Pennsylvania Pipe Lines deliveries were 700,713 bbls. in November this year, against 551,179 bbls. a year ago. For the first 11 months of 1931 deliveries of Buckeye Pipe were 35,433,229 bbls., compared with 27,652,472 bbls. in the same period of 1930. South West Pennsylvania Pipe Lines deliveries were 9,606,228 bbls. in the 11 months of 1931, against 7,299,696 bbls."

### Prairie-Sinclair

Directors of Sinclair Consolidated Oil Corp., Prairie Oil & Gas Co. and Prairie Pipe Line Co. are expected to approve shortly merger terms, and stockholders of the three companies are expected to vote on the consolidation early in January.

The exchange basis, as reported in Wall Street, is share for share on Sinclair and Prairie Oil & Gas, and 14 for 10 on Prairie Pipe and Sinclair.

"Although negotiations relative to the proposed consolidation of Sinclair Consolidated Oil Corp., Prairie Oil & Gas Co. and Prairie Pipe Line Co. have been under way for a year or more, numerous details still remain to be worked out before a statement can be made with the assurance that the merger will materialize," W. S. Fitzpatrick, chairman of the board of Prairie Oil & Gas Co., said.

"However," he said, "I do believe the major obstacles to the consolidation have been removed and that the three companies favor the amalgamation, and it is possible formal action will be taken by the respective boards early in the new year, in the event of which, of course, the recommendations would be submitted for ratification by the stockholders of each company."

Mr. Fitzpatrick admitted that if the plan met with final approval the most convenient means of linking up the three concerns would be by organizing a holding company and exchanging the stock of the various companies for that of the new company. He stated that it was likely the exchange basis for Sinclair common and Prairie Oil & Gas would be share for share, while for the pipe line company it would probably be 14 shares of new stock for each 10 of the pipe line.

"All negotiations with Tide Water Associated and Rio Grande oil companies have been dropped and there is no likelihood of them entering into the agreement," he said.

### Twenty Representative Stocks

The Oil and Gas Journal's weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb, based on closing quotations for Wednesday, was as follows:

| | | | |
|---|---|---|---|
| May 6 | 20.74 | Sept. 2 | 22.30 |
| May 13 | 20.38 | Sept. 9 | 20.38 |
| May 20 | 19.25 | Sept. 16 | 18.30 |
| May 27 | 18.35 | Sept. 23 | 17.64 |
| June 3 | 18.00 | Sept. 30 | 15.83 |
| June 10 | 19.62 | Oct. 7 | 15.86 |
| June 17 | 19.23 | Oct. 14 | 16.43 |
| June 24 | 22.33 | Oct. 21 | 17.58 |
| July 1 | 22.32 | Oct. 28 | 16.80 |
| July 8 | 21.24 | Nov. 4 | 18.86 |
| July 15 | 19.79 | Nov. 11 | 18.74 |
| July 22 | 21.33 | Nov. 18 | 17.60 |
| July 29 | 20.68 | Nov. 25 | 16.68 |
| Aug. 5 | 20.80 | Dec. 2 | 16.09 |
| Aug. 12 | 21.00 | Dec. 9 | 15.38 |
| Aug. 19 | 24.25 | Dec. 16 | 12.60 |
| Aug. 26 | 23.26 | Dec. 23 | 12.06 |

### Anglo-Persian Oil

Anglo-Persian Oil Co., Ltd., proposes to increase its capital to £26,500,000 from £24,000,000 by the creation of 2,500,000 of £1 shares in order to give effect to the recent offer made to the Scottish Oil group to exchange shares. Acceptance of the offer has been received from shareholders representing more than 90 per cent of the stocks of the four Scottish companies involved, namely, Scottish Oils, Broxburn, Oakbank and Pumpherston.

On the assumption that all the outstanding preference shares of each company will be acquired, the transaction will involve an Anglo-Persian issue of 233,332 8 per cent first preference shares and 1,975,538 9 per cent second preference shares, which will be provided out of the 2,500,000 shares which are to be created.

### Sinclair Consolidated Oil

H. F. Sinclair, chairman of the board of the Sinclair Consolidated Oil Corp., has issued the following statement:

"With the experience of the past two years in mind, only a reckless person would care to make any prophecies as to the business prospects of 1932. Every business management must, for its own guidance, have convictions as to what the near future will bring forth. The greatest difficulty is in attempting to tell what will be the effect on our own situation of conditions beyond our control, such as the course of events in other countries.

"Times such as these have one advantage, if no other: They compel managements to scrutinize expenditures carefully, make every economy that can be made without sacrifice of efficiency, and cut out the underbrush that grows up in every organization. The hard work of personnel, careful management, limitation of inventories, conservation of resources has placed industry in a better position to meet the future and realize upon any betterment in conditions.

"As to the oil industry in particular—and all the large organizations are subject to the same conditions to a greater or less extent—it seems to me that the year closes with an improved outlook. So far as stocks of crude and refined oils are concerned we have a better statistical position than a year ago. We are fortunate in having a demand for our products that is at least up to the levels of the past. What we need is a proper relation between the prices of crude oil and the refined products, gasoline, lubricants, fuel oil, etc.

"Looking at the service station signs, the public may think that prices of refined products are high enough. However, for gasoline for which the motorist

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## STANDARD OIL STOCKS ON NEW YORK CURB

**Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.**

(Complete record week ending Dec. 19)

| 1931 High | 1931 Low | Week ended Dec. 19 Sales | Week ended Dec. 19 High | Week ended Dec. 19 Low | Close Dec. 23 | Stocks— | Outstanding capital | Par value | Div. rate | Payable or last paid | 1932 High | 1932 Low | 1930 High | 1930 Low | 1930 High | 1930 Low |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ⅛ | 500 | ⅛ | ⅛ | ⅛ | ..Atlantic Lobos | 499,448 | N.P. | .... | 5-28-30 | .. | .. | .. | .. | 1 | ⅛ |
| 16 | 6 | 300 | 6½ | 6 | .. | Borne Scrymser | $1,000,000 | $25 | .... | 10-15-30 | 56½ | 44½ | 46½ | 25 | 25 | 11¼ |
| 56 | 33 | 100 | 33 | 33 | .. | Buckeye Pipe Line | $10,000,000 | $50 | $1Q | 12-15-31 | 76 | 53 | 74½ | 55 | 69 | 39⅞ |
| 129½ | 75 | 100 | 75 | 75 | .. | Chesebrough Mfg. | $3,000,000 | $25 | $1Q‡ | 9-30-31 | 161 | 117 | 210 | 130 | 184⅞ | 104⅛ |
| 3⅞ | 1⅝ | 22,400 | 2⅛ | 1⅞ | 2 | Creole Petroleum (sh) | 5,977,872 | N.P. | .... | ..... | 17½ | 9½ | 11¾ | 5⅝ | 7⅞ | 3 |
| 39 | 20⅝ | 200 | 28 | 26½ | .. | Cumberland Pipe Line | $1,500,000 | $50 | 50cQ | 6-15-31 | 114 | 67 | 75¾ | 40 | 65¾ | 20¼ |
| 36 | 19 | 200 | 24¾ | 22 | .. | Eureka Pipe Line | $5,000,000 | $100 | $1Q | 11- 1-31 | 88 | 64⅛ | 70½ | 40 | 54¾ | 26 |
| 3 | 1 | 200 | 1⅛ | 1⅛ | 1 | Galena Signal Oil | $16,000,000 | $100 | .... | ..... | 13 | 4¼ | 6½ | 3 | 7 | 2⅛ |
| 72 | 46⅜ | 13,000 | 47½ | 46⅜ | 45⅝ | Humble Oil & Refining | $74,103,300 | $25 | 50cQ | 1- 1-32 | 114¾ | 59½ | 128 | 74⅛ | 119 | 57⅛ |
| 18¼ | 7⅜ | 22,300 | 8⅜ | 7½ | 7⅞ | Imperial Oil of Canada (new) (sh) | 25,421,768 | N.P. | 12½cQ | 12- 1-31 | 104 | 56¾ | 41 | 22 | 30 | 15 |
| 21⅛ | 5½ | 200 | 6½ | 6 | 6¼ | Indiana Pipe Line (new) | $3,000,000 | $10 | 25cQ | 8-15-31 | 91⅞ | 74⅜ | 41⅞ | 26 | 41 | 14⅛ |
| 15½ | 7⅜ | 45,800 | 9⅛ | 7¾ | 8⅞ | International Petroleum (new) (sh) | 14,247,088 | N.P. | 25cQ | 12-15-31 | 55 | 35 | 30⅜ | 15 | 24 | 11⅜ |
| 17½ | 5 | 1,700 | 7½ | 5 | .. | National Transit | $6,362,500 | $12.50 | 25cQ | 12-15-31 | 32⅜ | 19⅜ | 25½ | 10¼ | 22⅜ | 11½ |
| 14½ | 5⅞ | 1,100 | 8¼ | 7⅛ | 7⅞ | New York Transit | $1,000,000 | $10 | 25cQ | 10-15-31 | 75 | 38½ | 17½ | 10 | 21⅜ | 10⅛ |
| 35½ | 20 | No sales | .. | .. | .. | Northern Pipe Line | $2,000,000 | $50 | $28A | 7- 1-31 | 69 | 56½ | 63 | 41 | 54 | 26¼ |
| 15½ | 5½ | 700 | 6⅞ | 5½ | .. | Penn Mex Fuel | $10,000,000 | $25 | 50c | 10-31-31 | 84 | 28 | 44½ | 20 | 32 | 12 |
| 16½ | 3¼ | No sales | .. | .. | .. | Solar Refining | $4,000,000 | $25 | .... | 12-20-29 | .. | .. | 50 | 20 | 33 | 4⅞ |
| 23⅞ | 9¼ | 9,100 | 12½ | 9¼ | 9¾ | South Penn Oil | $30,000,000 | $25 | 25cQ | 12-31-31 | 71⅞ | 36¾ | 60¼ | 35⅛ | 45⅞ | 16⅛ |
| 17 | 7 | 1,500 | 9 | 7 | .. | Southern Pipe Line | $1,000,000 | $10 | 50cQ | 9- 1-31 | 19 | 15 | 22½ | 13 | 20⅞ | 8⅝ |
| 42½ | 25 | 200 | 28 | 27 | .. | Southwest Pennsylvania Pipe Line | $1,750,000 | $50 | $1Q | 12-31-31 | 102 | 70 | 70 | 60 | 64 | 32 |
| 38½ | 14⅛ | 115,100 | 16⅞ | 14⅛ | 14⅛ | Standard Oil of Indiana | $348,175,069 | $25 | 25cQ | 12-15-31 | 95⅞ | 70⅞ | 63 | 45 | 59⅞ | 30 |
| 23⅝ | 12⅝ | 16,300 | 14¾ | 12⅝ | 13 | Standard Oil of Kentucky | $25,654,516 | $10 | 40cQ | 12-31-31 | 179¾ | 122¼ | 46⅞ | 29 | 40½ | 18⅝ |
| 36½ | 16½ | 500 | 20 | 20 | .. | Standard Oil of Nebraska | $4,640,225 | $25 | 50cQ | 12-21-31 | 54⅞ | 39⅞ | 50¼ | 40 | 48⅞ | 34⅝ |
| 62½ | 23¾ | 1,300 | 33⅜ | 23¾ | 24⅛ | Standard Oil of Ohio | $14,000,000 | $25 | 62½cQ | 1- 2-32 | 134 | 71 | 129 | 60 | 108½ | 43¼ |
| 4½ | 1 | 400 | 2⅛ | 1 | .. | Swan-Finch Co. (sh) | 34,480 | $25 | .... | 1-15-29 | 23¼ | 16 | 18 | 10 | 10 | 4 |

*Ex-dividend. †Unit of trading less than 100 shares. ‡Plus 50 cents extra.

# INDEPENDENT OILS ON NEW YORK CURB

**Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.**

(Complete record week ending Dec. 19)

| 1931 High | 1931 Low | Week ended Dec. 19 Sales | Week ended Dec. 19 High | Week ended Dec. 19 Low | Close Dec. 22 | Stocks— | | Outstanding capital | Par value | Div. rate | Payable or last paid | 1928 High | 1928 Low | 1929 High | 1929 Low | 1930 High | 1930 Low |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1⅜ | ¼ | 2,500 | ⅜ | ¼ | ¼ | American Maracaibo | (sh) | 700,000 | N.P. | .... | ..... | 9½ | 3⅛ | 8⅝ | 1⅛ | 4½ | ⅛ |
| 16⅞ | 6¼ | 500 | 7⅞ | 7⅜ | .. | British American Oil Corp. | | 1,311,321 | N.P. | 20cQ | 10- 1-31 | 55 | 32¾ | 62 | 7⅞ | 23 | 13⅜ |
| 2⅜ | ¼ | 3.800 | ⅜ | ¼ | ¼ | Carib Syndicate | | $131,250 | 25c | .... | ..... | 4½ | 3⅞ | 4⅞ | 1 | 2¾ | ⅜ |
| 20¾ | 5 | 137.300 | 5⅞ | 5 | 5⅜ | Cities Service | (sh) | 24,290,359 | N.P. | 30cA§ | 11- 1-31 | 90⅞ | 54 | 68½ | 20 | 44¼ | 13 |
| 84¾ | 35⅜ | 2.300 | 48¾ | 45½ | 46 | Cities Service pfd. | (sh) | 1,500.000 | N.P. | 50cM | 11- 1-31 | 103¼ | 94½ | 98¾ | 84 | 93⅞ | 78¼ |
| ½ | 1/16 | 10,300 | ⅛ | 1/16 | 1/16 | Colombia Syndicate | | $2,000.000 | $1 | .... | ..... | 3¼ | .76 | 2 | ½ | ¾ | ⅛ |
| 2¾ | 1 | 600 | 1 | 1 | .. | Consolidated Royal | | $5,527,875 | $10 | 5cQ | 10-25-31 | 8⅞ | 6¼ | 11⅛ | 2½ | 5⅞ | 2 |
| ⅝ | ⅛ | 2,600 | ⅛ | ⅛ | .. | Crown Central | | ..... | .... | .... | ..... | .. | .. | .. | .. | .. | .. |
| 5 | 2 | 1,700 | 2⅛ | 2 | .. | Darby Petroleum (new) | | 1,019.392 | N.P. | .... | 10-15-30 | 33½ | 3¼ | 26 | 6½ | 21⅝ | 4¼ |
| 6 | 1½ | 1,200 | 1⅞ | 1½ | 2 | Derby Oil & Refining | (sh) | 500.000 | N.P. | .... | ..... | 2¼ | 1 | 11 | 2 | 11 | 2 |
| 40⅛ | 25 | 100 | 25 | 25 | .. | Derby Oil & Refining pfd. | | 48.500 | N.P. | .... | ..... | 21⅛ | 7½ | 44 | 20¾ | 60 | 30 |
| 75½ | 25⅜ | 26 000 | 29⅞ | 25⅜ | 27 | Gulf Oil Corp. | (sh) | 4,504,921 | $25 | .... | 10- 1-31 | 165 | 101⅛ | 209 | 115 | 166⅞ | 58½ |
| ⅝ | ⅛ | 2,800 | ⅛ | ⅛ | .. | Intercontinental Petroleum | | $5,682.000 | $5 | .... | ..... | 3⅜ | 1 | 2⅞ | ⅝ | 1¾ | ⅜ |
| 1⅞ | ¼ | No sales | .. | .. | .. | Kirby Petroleum | (sh) | 750.000 | N.P. | .... | ..... | 3 | 1¼ | 3⅝ | 1¼ | 3 | ⅞ |
| 1½ | ¼ | 8.400 | ⅛ | ¼ | ¼ | Leonard Oil & Development | | $50,000.000 | $25 | .... | ..... | 9⅜ | 5⅛ | 6⅛ | 1 | 4¾ | ½ |
| 6¾ | 2½ | 900 | 2¾ | 2½ | .. | Lion Oil & Refining | (sh) | 250.000 | N.P. | .... | 10-27-30 | 43⅞ | 20 | 38⅞ | 18 | 29 | 4⅞ |
| 25 | 5½ | 25.300 | 7¾ | 5½ | 7⅜ | Lone Star Gas | (sh) | 5,000.000 | N.P. | 22cQ | 12-31-31 | 69¼ | 48½ | 67⅞ | 28 | 55⅞ | 19⅝ |
| ½ | ⅛ | 8,200 | ⅛ | ⅛ | .. | Magdalena Syndicate | (sh) | 850.000 | $1 | .... | ..... | 1⅞ | ½ | 1¼ | ½ | ½ | ⅛ |
| 5 | 2 | 200 | 2½ | 2¼ | 2¼ | Margay Oil Corp. | | 160,000 | N.P. | .... | 7-10-30 | 48½ | 32 | 38½ | 14 | 16 | 3 |
| 4⅞ | 1½ | 300 | 2½ | 2½ | .. | Mexico-Ohio Oil Co. | | 500,000 | N.P. | .... | ..... | 8 | 2¾ | 6⅜ | 2¼ | 7½ | 1⅜ |
| ½ | ⅛ | No sales | .. | .. | .. | Mountain & Gulf | | $4,000.000 | $1 | .... | 4-15-31 | 1⅜ | .76 | 1½ | ½ | ¾ | ⅜ |
| 5⅞ | 2 | 2,000 | 2⅝ | 2 | .. | Mountain Producers | | $1,682,182 | $10 | 20cQ | 1- 2-32 | 28⅞ | 19½ | 22⅞ | 7 | 12⅛ | 3¾ |
| 1½ | ½ | 950 | ⅝ | ½ | .. | New Bradford Oil | | $1,095,291 | $5 | .... | 4-15-31 | 5⅝ | 4¼ | 5 | 2½ | 3½ | 1⅛ |
| 3 | ¾ | 200 | ¾ | ¾ | ⅞ | New Mexico and Arizona | | $1,000.000 | $1 | .... | ..... | 11⅞ | 7⅛ | 9⅜ | 2¼ | 7¼ | 1½ |
| 3¼ | ⅝ | 1.200 | ¾ | ⅝ | .. | North Central Texas | (sh) | 400.000 | N.P. | .... | 9- 2-30 | 14¼ | 8½ | 18½ | 6⅛ | 11¼ | 2⅛ |
| ½ | ⅛ | 4.100 | ⅛ | ⅛ | .. | Pandem | (sh) | 489.875 | N.P. | .... | ..... | 6 | 2⅛ | 3½ | ½ | 2½ | ¼ |
| 2 | ⅜ | 2,400 | ½ | ⅜ | .. | Pantepec Oil | (sh) | 1,506.000 | N.P. | .... | ..... | 15⅝ | 8½ | 10½ | 1⅞ | 4⅜ | ⅞ |
| 3⅛ | ½ | 800 | ½ | ½ | ⅜ | Reiter-Foster | (sh) | 388,584 | N.P. | .... | 12- 2-29 | 12⅞ | 4⅛ | 8½ | 1⅛ | 5⅜ | 1 |
| 3 | ⅞ | 600 | 1 | ⅞ | .. | Ryan Consolidated | (sh) | 800.000 | N.P. | .... | ..... | 12 | 4⅛ | 11 | 2 | 8⅝ | 2 |
| 1⅜ | ¼ | 500 | ⅜ | ¼ | .. | Salt Creek Consolidated | (sh) | 1.286,300 | $10 | .... | 4- 1-31 | 7¼ | 5½ | 5⅞ | 1⅞ | 2½ | ½ |
| 7¾ | 3⅛ | 4.700 | 3⅝ | 3⅛ | 3⅛ | Salt Creek Producers | (sh) | 1.496,859 | $10 | 25c | 11- 2-31 | 35 | 23⅛ | 25⅞ | 9 | 15¼ | 5¼ |
| 5¼ | ¼ | 9,443 | ⅜ | ¼ | ⅛ | Sunray Oil | (sh) | 1,163,185 | $5 | .... | 4-15-31 | .. | .. | 12 | 5⅝ | 10 | 2 |
| 1⅞ | ¼ | 700 | ⅜ | ¼ | ⅛ | Venezuelan Petroleum | (sh) | 755,090 | $5 | .... | 2-15-30 | 9⅛ | 4¾ | 6½ | 1¾ | 4½ | ⅝ |
| 3½ | 1⅛ | No sales | .. | .. | .. | Woodley Petroleum | | $500.000 | $1 | .... | 3-31-29 | 8¼ | 4⅞ | 9½ | 2 | 5 | ½ |
| 2¼ | ¼ | 300 | ⅜ | ⅜ | .. | Y Oil & Gas | | 100.000 | N.P. | .... | ..... | 8⅜ | 2⅛ | 2⅞ | ½ | 2½ | ⅝ |

*Ex-dividend. †Unit of trading less than 100 shares. ‡Payable monthly and monthly stock dividend of one-half per cent. §Paid in lieu of regular cash dividend of 2 per cent.

# TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

**Quotations Compiled by Francis, Bro. & Co., Members of the New York Stock Exchange and Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.**

(Complete record week ending Dec. 19)

| 1931 High | 1931 Low | Week ended Dec. 19 Sales | Week ended Dec. 19 High | Week ended Dec. 19 Low | Close Dec. 23 | Stocks— | | Outstanding capital | Par value | Div. rate | Payable or last paid | 1928 High | 1928 Low | 1929 High | 1929 Low | 1930 High | 1930 Low |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | 11¼ | 23.800 | 14½ | 11¼ | .. | Amerada Corp. | (sh) | 922.075 | N.P. | 50cQ | 10-30-31 | 43⅞ | 27⅛ | 42⅝ | 17½ | 31½ | 16½ |
| 12⅜ | 1¼ | 2.400 | 2 | 1¼ | 1¼ | American Republics Corp. | (sh) | 209.180 | N.P. | .... | 12-31-30 | 85 | 51⅛ | 64¾ | 12½ | 37 | 5⅛ |
| 31 | 9 | 100 | 10½ | 9 | .. | Associated Oil | | $57,260.300 | $25 | .... | 6-30-31 | 53⅜ | 37½ | 47¼ | 34½ | 51 | 30 |
| 23⅝ | 8⅞ | 39,100 | 10⅜ | 8⅞ | 9⅛ | Atlantic Refining | | $66,763,775 | $25 | 25cQ | 12-15-31 | 66⅜ | 50 | 77⅞ | 30 | 51⅜ | 16⅝ |
| 14½ | 4¼ | 47.250 | 5⅜ | 4¼ | 4½ | Barnsdall Corp. A | | $56,546.600 | $25 | .... | 5-11-31 | 54 | 20 | 49½ | 20 | 34 | 8⅝ |
| 12 | 5 | 61,900 | 6¼ | 5⅝ | 5⅝ | Continental Oil of Delaware | (sh) | 4,741,554 | N.P. | .... | 12-15-27 | .. | .. | 47⅞ | 18 | 30½ | 7⅝ |
| 47 | 9⅝ | 9,900 | 13¼ | 10⅛ | 11 | General Asphalt | (sh) | 413.333 | N.P. | 50cQ | 12-15-31 | 94⅞ | 68 | 94⅜ | 42¼ | 71½ | 22⅜ |
| 68½ | 15⅜ | 10.800 | 20½ | 15⅝ | 17¼ | Houston Oil | | $24,968.600 | $100 | .... | 10-17-30 | 167 | 79 | 109 | 26 | 116⅞ | 29¼ |
| 4⅝ | 1⅛ | 2,300 | 1½ | 1⅛ | 1¼ | Indian Refining | | $12,564.070 | $10 | .... | 10- 1-30 | 39⅝ | 9 | 53 | 13⅛ | 17 | 2 |
| 4½ | 1⅛ | 2,800 | 1¼ | 1⅛ | 1⅛ | Louisiana Oil Refining | (sh) | 1,190.063 | N.P. | .... | ..... | 19¾ | 9⅜ | 18 | 7 | 12 | 3½ |
| 3⅜ | ½ | 400 | 1 | ⅞ | .. | Maracaibo Oil | (sh) | 330.000 | N.P. | .... | ..... | 25½ | 12½ | 18½ | 5⅛ | 10⅜ | 1⅜ |
| 16¾ | 5 | 24.100 | 6 | 5 | 5½ | Mid-Continent Petroleum | (sh) | 1,857.912 | N.P. | .... | 2-16-31 | 44½ | 25⅛ | 39⅞ | 22⅛ | 32 | 11 |
| 19½ | 5⅛ | 40.700 | 6⅜ | 5⅛ | 5½ | Ohio Oil | (sh) | 6.648.052 | N.P. | .... | 3-14-31 | 84 | 58½ | 79⅞ | 64¼ | 32 | 16 |
| 35⅛ | 20 | No sales | .. | .. | .. | Pan American P. & T. | | $50.084.700 | $50 | 40c | 1-20-31 | 50⅞ | 38¼ | 69 | 40½ | 46½ | 42 |
| 36½ | 19 | 700 | 21½ | 19 | .. | Pan American P. & T. "B" | | $121,110,650 | $50 | 40c | 1-20-31 | 59⅞ | 37¾ | 69¼ | 40½ | 67¼ | 30 |
| 4¼ | ⅝ | 500 | ⅝ | ⅝ | .. | Panhandle P. & R. | (sh) | 199.370 | N.P. | .... | ..... | 21⅜ | 11½ | 15¼ | 3 | 12⅜ | 1⅜ |
| 20⅛ | 6 | 10 | 6 | 6 | .. | Panhandle P. & R. pfd. | | $2,564,400 | $100 | .... | ..... | 108 | 70 | 76 | 47½ | 20 | 47½ |
| 16⅝ | 4 | 51,580 | 5 | 4 | 4½ | Phillips Petroleum | (sh) | 2.593.075 | N.P. | .... | 1- 2-31 | 53⅞ | 35¼ | 47 | 24¼ | 44⅜ | 11½ |
| 1½ | ¼ | 1.100 | ⅜ | ¼ | ¼ | Pierce Oil Corp. | | $29,622.831 | $25 | .... | ..... | 5¼ | ½ | 3⅜ | 1 | 2½ | ½ |
| 3⅜ | ½ | 10.400 | ⅞ | ½ | ¾ | Pierce Petroleum | (sh) | 2,500.000 | N.P. | .... | 2-16-31 | 7 | 3½ | 5⅞ | ½ | 7⅛ | 1⅛ |
| 20⅜ | 5 | 13.800 | 6 | 5 | 4¾ | Prairie Oil & Gas | | $60,848.000 | $25 | .... | 3-31-31 | 68 | 46 | 65⅜ | 40½ | 54 | 11¼ |
| 28½ | 6¼ | 16,500 | 7¾ | 6¼ | 6 | Prairie Pipe Line | | $101,250.000 | $25 | .... | 6-30-31 | 280 | 172 | 65 | 45 | 60 | 16⅝ |
| 6 | 1 | 1,800 | 1⅜ | 1 | 1⅛ | Producers & Refiners | | $37,438.950 | $50 | .... | 9-15-23 | 29⅞ | 16 | 25⅞ | 4 | 11⅞ | 1 |
| 16 | 3 | 230 | 3⅝ | 3 | .. | Producers & Refiners pfd. | | $2,845,350 | $50 | .... | 5- 4-25 | 49⅝ | 41 | 46¾ | 25½ | 40 | 11½ |
| 11⅞ | 3¼ | 39.600 | 4⅜ | 3¼ | 3⅜ | Pure Oil | | $75,959.250 | $25 | .... | 9- 1-30 | 31⅝ | 19 | 30¾ | 20 | 27¼ | 7⅝ |
| 6⅜ | ⅝ | 8.300 | ⅝ | ⅝ | ⅝ | Richfield Oil (new) | | $52,410.875 | N.P. | .... | ..... | 56 | 23 | 49⅝ | 20 | 9⅜ | 4⅛ |
| 10¼ | 1¼ | 6.700 | 2 | 1¼ | 1⅛ | Rio Grande Oil | (sh) | 1,236.270 | N.P. | .... | 7-25-30 | 37½ | 32 | 42½ | 15 | 25⅝ | 5 |
| 42⅝ | 13½ | 12.600 | 15⅛ | 13¼ | 13⅜ | Royal Dutch N. Y. | (sh) | 611.303 | .... | $0.938 | 8- 4-31 | 64 | 44⅝ | 64 | 43⅛ | 56½ | 36⅞ |
| 20¾ | 5½ | 19,000 | 7½ | 6 | 6½ | Seaboard Oil of Delaware | (sh) | 1.244,383 | N.P. | .... | 10- 1-24 | 72 | 4⅝ | 59⅜ | 8¼ | 37 | 9⅝ |
| 34 | 5 | 130 | 5 | 5 | .. | Shell Transport & Trading Co. | | £23,985,000 | £1 | $0.966 | 7- 6-31 | 47⅞ | 41⅜ | 51½ | 40⅝ | 48⅝ | 26 |
| 10¼ | 3 | 32.205 | 3⅝ | 3 | 3⅛ | Shell Union Oil | (sh) | 13.066,497 | N.P. | .... | 6-30-30 | 39¼ | 23¼ | 31⅜ | 19 | 25½ | 5⅛ |
| 11 | 3½ | 6,400 | 4¾ | 3½ | 4⅛ | Simms Petroleum | | $8,353.620 | $20 | .... | 9-15-30 | 27½ | 18⅛ | 40⅛ | 15 | 37 | 5⅝ |
| 15⅞ | 4⅛ | 82,400 | 5¼ | 4⅛ | 4⅝ | Sinclair Consolidated | (sh) | 5,500.000 | N.P. | .... | 4-15-31 | 46¾ | 17⅜ | 45 | 21 | 32 | 9⅝ |
| 103 | 64 | 800 | 67 | 64 | .. | Sinclair Consolidated pfd. | | $16,025.250 | $100 | $2Q | 11-14-31 | 110 | 102½ | 111 | 103 | 112¼ | 86 |
| 12⅞ | 2½ | 6.300 | 3⅛ | 2½ | 2½ | Skelly Oil | | $27,441.250 | $25 | .... | 12-15-30 | 42⅝ | 25 | 40½ | 28 | 12 | 10⅛ |
| 21 | 9 | 144.095 | 10⅜ | 9 | 9 | Socony-Vacuum | (sh) | 31,923,072 | $25 | 25c | 12-15-31 | .. | .. | .. | .. | .. | .. |
| 51¾ | 23⅝ | 103.594 | 27⅜ | 23⅝ | 23⅝ | Standard of California | (sh) | 12,594.098 | N.P. | 62½cQ | 12-15-31 | 80 | 63 | 81⅞ | 51½ | 75 | 42½ |
| 19 | 8¼ | 1.800 | 9¼ | 8 | 9½ | Standard of Kansas | | $8.000.000 | $25 | .... | 3-16-31 | 37¾ | 15 | 33¾ | 18 | 49 | 14⅜ |
| 52½ | 26¾ | 285.800 | 30½ | 26¾ | 26⅝ | Standard Oil of New Jersey | | $634,999.200 | $25 | 25cQ§ | 12-15-31 | 59⅜ | 37¾ | 83 | 49 | 84⅞ | 32½ |
| 45½ | 26¾ | 8.100 | 30½ | 29 | 29 | Sun Oil | (sh) | 1,416,869 | N.P. | 25cQ | 12-15-31 | 77 | 31½ | 68⅜ | 55 | 70 | 39 |
| 1⅜ | ¼ | 6.645 | ⅜ | ¼ | ¼ | Superior Oil Corp. | (sh) | 766,979 | N.P. | .... | 12-20-30 | .. | .. | 24 | 5¼ | 9⅜ | ⅜ |
| 36¼ | 9⅞ | 130.400 | 14⅜ | 9⅞ | 11⅛ | The Texas Corporation | | $246.204.900 | $25 | 50cQ | 10- 1-31 | 74¾ | 50 | 71⅞ | 50 | 60½ | 28¼ |
| 6½ | 2 | 5,100 | 2⅜ | 2 | 2⅛ | Texas Pacific Coal & Oil Co. | | $0.304.890 | $10 | .... | 12-31-29 | 26⅝ | 12⅛ | 23⅞ | 9½ | 14½ | 4 |
| 18 | 9⅞ | No sales | .. | .. | .. | Tide Water Oil | (sh) | 2.191.759 | N.P. | .... | 6-30-31 | 41½ | 19⅝ | 40 | 14 | 31 | 13 |
| 83 | 35 | 1,100 | 37 | 35 | .. | Tide Water Oil pfd. | (sh) | 19.947.000 | N.P. | $1.25Q | 11-16-31 | 100⅛ | 86 | 97½ | 85⅛ | 94⅞ | 71 |
| 9 | 2¼ | 21.000 | 3 | 2¼ | 2½ | Tide Water Associated | (sh) | 5,560.424 | N.P. | .... | 2-16-31 | 25 | 14¾ | 23½ | 10 | 17¾ | 5⅜ |
| 68 | 20½ | 3.400 | 28 | 21 | 24½ | Tide Water Associated pfd. | | $73.284.500 | .... | $1.50Q | 10- 1-31 | .. | .. | 90⅞ | 74⅛ | 89¾ | 55 |
| 26⅝ | 11 | 15.900 | 13½ | 11 | 12¼ | Union Oil of California | | $104.342.375 | $25 | 50cQ | 11-10-31 | 58 | 42⅜ | 57 | 42½ | 50 | 10⅛ |
| 25½ | 16 | 5.700 | 17½ | 16 | 16 | Union Tank Car | (sh) | 1,254.048 | $100 | 40cQ | 12- 1-31 | 128⅛ | 110 | 163¾ | 121⅞ | 38½ | 23 |
| 7⅜ | 1 | 3.700 | 1⅜ | 1 | 1 | Warner-Quinlan | (sh) | 632.948 | N.P. | .... | 7- 1-30 | 44⅞ | 26 | 42⅞ | 15 | 27 | 4⅛ |
| 9⅜ | 2¾ | 2,200 | 3⅜ | 2⅞ | 2¾ | Wilcox Oil & Gas | (sh) | 428,907 | N.P. | .... | 5-10-28 | .. | .. | 29¾ | 12⅞ | 21 | 6½ |

*Ex-dividend. †Unit of trading less than 100 shares. ‡Plus extra dividend of 25 cents.

In comparing highs and lows for the several years in the three tables, it will be necessary to take into consideration cases where there have been stock split-ups.

## FOREIGN OIL EXPORTS TO THE UNITED STATES

(Continued from Page 14)

Mexico during the year 1930 is reported in Table 2.

TABLE 2.
(In barrels of 42 gallons)

| Product— | Tampico district | Isthmus district | Total |
|---|---|---|---|
| Gasoline | 3,554,752 | 1,306,534 | 4,891,286 |
| Kerosene | 1,908,273 | 789,810 | 2,698,083 |
| Gas and fuel oil | 11,289,481 | 4,862,718 | 16,152,199 |
| Lub oils | 143,588 | 486,116 | 629,704 |
| Other dis. | 1,373,988 | 195 | 1,374,183 |
| Total | 18,300,082 | 7,445,373 | 25,745,455 |
| Paraffin wax (lbs.) | 98,108,800 | | 98,108,800 |
| Asphalt (metric tons) | 218,440 | 31 | 218,471 |

It is reported that all the operating refineries in Mexico are equipped with heaters of modern type and with bubble towers for fractionation.

The cracking equipment of Mexico consists of a 1,000-bbl. plant at the refinery at Minititlan and a 3,000-bbl. unit at one of the refineries at Tampico. Both are of the liquid phase type. There is also a vapor phase 1,000-bbl. unit at one of the refineries at Tampico.

Natural gasoline is recovered in practically all oil fields in Mexico. Most of it is mixed with the crude for pumping to the refineries.

### Trinidad

Five petroleum refineries, with modern equipment, are reported to have been in operation in Trinidad during 1929 and 1930. The supply of crude oil is usually obtained locally, but recently one or more shipments have been received from oil fields in Venezuela. Two of the five refineries are owned by American interests; three by British interests. One of the latter, having a daily capacity of some 28,000 bbls. of crude petroleum, constitutes about 75 per cent of the total capacity of all refineries on the island. This refinery is well provided with storage and shipping tanks and has excellent dock facilities. Its products include fuel oil, Diesel oil, gas oil, kerosene, gasoline and aviation spirits. In addition to shipping gasoline and fuel oil in bulk, this company does a large business in bunker oil. Neither of the two American-owned refineries ships any gasoline to the United States.

### Colombia

There is only one petroleum refinery in Colombia. This refinery, located at a port in the lower Magdalena River, operates entirely on crude petroleum from its own wells about 12 miles away. None of its refined products are exported to the United States. Particulars regarding the size, products and equipment of this refinery are shown in Table 6. A pipe line some 375 miles long, operated by an affiliated company, connects with the port of Cartegna one the Caribbean Sea.

### Peru

There are two petroleum refineries in Peru, both on the sea coast. One, with a daily capacity of some 16,000 bbls. of crude oil, is located at Talara; the other, with a daily capacity of 1,000 to 1,200 bbls. of crude oil, is at Zorritos. Neither exports any refined products to the United States.

The plant at Talara has storage capacity of about 2,000,000 bbls. It is reported that the equipment of this plant includes stills operating on the continuous distillation process, special equipment for the redistillation of naphtha distillates, lubricating oil, a plant for the chemical treatment of derivatives, equipment for the recovery of sulphuric acid, and a case and can plant.

This plant is also equipped with four units, each with a capacity for cracking 1,800 bbls. of fuel oil daily. Equipment for making pale lubricating oils, and also for making greases was added in 1929. The company has dock facilities at Talara, and a floating pipe line for "bunkering" ships and for loading tankers.

The other refinery in Peru is small, with a capacity for treating some 1,000 bbls. of crude petroleum daily. According to the latest available information this plant is operating at about 20 per cent capacity, refining about 220 bbls. daily. It has a small plant for the treatment of kerosene, and storage capacity for some 3,500 bbls. of refined products and about 50,000 bbls. of crude petroleum. It maintains a pier about 1,000 feet long and a floating pipe line for bunkering ships and loading tankers.

In 1929 the quantity of the different products of the refinery at Talara was approximately as reported in Table 3.

TABLE 3.

| Product— | A.P.I. gravity at 60°F. | Prod. in 1929 Bbls. | Per cent of total |
|---|---|---|---|
| Heavy naphtha* | 50-56 | 17,355 | .31 |
| Gasoline | 58-64 | 2,532,194 | 44 42 |
| Turpentine sub. | | 0 | 0 |
| Kerosene | 42 | 699,372 | 12.27 |
| Fuel oil | 27-29 | 2,274,042 | 39.89 |
| Lubricating oil | 18-24 | 45,627 | .80 |
| Asphalt | | 3,150 | .06 |
| Coke (petroleum) | | 2,281 | .04 |
| Still gas (burned) | | 89,575 | 1 57 |
| Losses | | 36,645 | .64 |
| Total | | 5,700,241 | 100 00 |

*For tractors.

In 1930 the total production of refined products at the Talara refinery amounted to some 5,200,000 bbls.

The total output of the other Peru refinery in 1929 amounted to 68,858 bbls. including 17,995 bbls. of gasoline, 34,537 bbls. of fuel oil, 12,890 bbls. of kerosene and small quantities of lubricating oils and mineral spirits (substitute for turpentine).

Some 727,000 bbls. of natural gasoline were produced in Peru in 1929, and 771,000 bbls. in 1930.

### Ecuador

There are three petroleum refineries in Ecuador, one of which has a capacity for treating some 750 bbls. of crude oil daily; one, a capacity of 80 bbls.; and the third, 70 bbls. Each refinery operates entirely on crude oil from its own wells, all of which are located on the Santa Elena Peninsula.

The company operating the largest refinery, at La Libertad, has a daily crude production of about 5,000 bbls. This production is pumped through a pipe line to the company's refinery about 9 miles away. This is the only modern plant in Ecuador.

Natural gas from the oil wells is used as fuel in making steam for operating the pumps. None is used for making natural gasoline.

The total quantity of crude oil run to stills by all three of the refineries in Ecuador during the years 1929 and 1930, and the products derived therefrom were as follows:

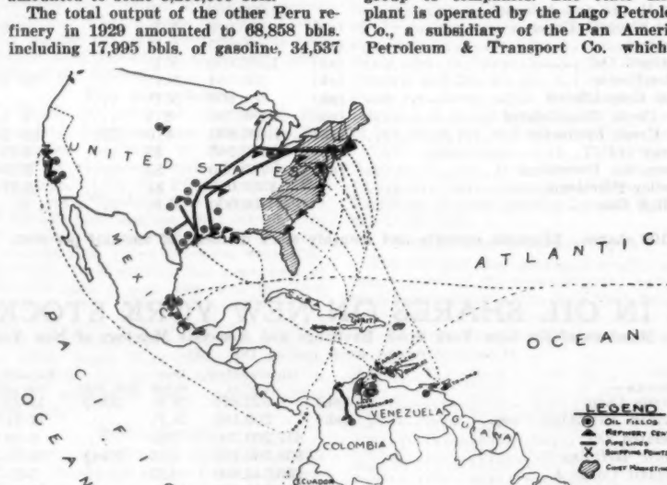
TABLE 4.

| | Bbls. 1929 | Bbls. 1930 |
|---|---|---|
| Crude oil runs | 146,592 | 160,456 |
| Gasoline | 32,980 | 44,323 |
| Kerosene | 25,563 | 26,105 |
| Gas oil | 5,071 | 3,081 |
| Diesel oil | 824 | 1,626 |
| Lubricating oil | 796 | 790 |
| Tar | 1,000 | 0 |
| Fuel oil | 72,946 | 78,239 |
| Loss | 8,388 | 6,292 |
| Total | 146,592 | 160,456 |

### Netherland West Indies

There are three petroleum refineries in the Netherland West Indies, with an aggregate daily capacity of approximately 297,000 bbls. of crude oil. One of these plants, at Curacao, of about 165,000 bbls. daily capacity, is the largest petroleum refinery in the world. The other two refineries, on the island of Aruba, have a daily capacity of about 110,000 bbls. and 22,000 bbls., respectively.

The plant at Curacao and the smaller one on the island of Aruba are affiliated through the Royal Dutch, or Anglo-Saxon group of companies. The other Aruba plant is operated by the Lago Petroleum Co., a subsidiary of the Pan American Petroleum & Transport Co. which in turn is controlled by the Standard Oil Co. of Indiana.




*Petroleum, crude and refined: Foreign and domestic sources of supply, with chief marketing area, refining centers, and transportation routes.*

These three plants are new and modern in every respect. The company operating the largest plant—that at Curacao—was established in 1914, but on account of the World War large construction was delayed until after 1920; the equipment of the refinery of the Lago Petroleum Co. has all been installed since the spring of 1928. The recent rapid increase in imports of refined products from the Netherland West Indies is due to the output of these two refineries, which are at present the source of most of the imports of refined products into the United States.

The refineries in the Netherland West Indies operate entirely on crude petroleum originating in the Maracaibo Basin in Venezuela. As local consumption is small, the extent of operations is indicated by the quantities of crude petroleum and refined products imported and exported by the islands. Table 5 gives such figures.

### Venezuela

There are eight petroleum refineries in Venezuela. The products of some of these plants do not enter either the local market or the export trade, but are produced by the oil companies for their own use.

The export trade in refined products to the United States is insignificant, amounting to about 270,000 bbls. (mostly gasoline) from January 1, 1929, to December 31, 1930.

Besides the refineries, there are several absorption and compressor plants now in operation for extracting gasoline from natural gas in Venezuela. Much of the production of these plants is turned back into crude, which is refined in local refineries or exported as crude.

TABLE 5.
(In barrels of 42 gallons)

| Product— | Imports 1929 | Imports 1930 | Exports 1929 | Exports 1930 |
|---|---|---|---|---|
| Crude petroleum | 91,804,413 | 106,384,607 | 17,437,584 | 10,524,829 |
| Gasoline | 837,202 | 2,067,870 | 9,713,589 | 17,042,901 |
| Kerosene | 1,407 | 1,059 | 158,519 | 104,423 |
| Lubricating oil | 481 | (*) | 1,042,195 | 830,993 |
| Gas oil | 2,183,538 | 1,129,511 | 6,166,104 | 5,817,507 |
| Diesel oil | 0 | 41,238 | 800,016 | 821,629 |
| Fuel oil | 315,677 | 539,952 | 54,396,047 | 59,305,671 |
| Spindle oil distillate | 0 | 0 | 32,497 | 0 |

*No data available.

## REPORT OF TARIFF COMMISSION ON OIL

(Continued from Page 15)

costs of that product were necessarily obtained as incidental to the ascertainment of the other costs. The refineries, both domestic and foreign, make a variety of gas oils and fuel oils. For purposes of cost comparison, however, it was necessary to treat this group as one. The commission found that the foreign refineries in the countries covered by the investigation make practically no lubricating oil, although moderate quantities are made by domestic refineries using foreign crude. It found also that there are such variations in grades of lubricating oils made from different crudes by different plants that an average cost per gallon has no significance. That part of the report relating to refined products consequently presents a comparison of costs only for gasoline, kerosene, and gas and fuel oils.

Costs were ascertained for these products delivered to the Atlantic Coast area. That area receives domestic gasoline, kerosene and gas and fuel oils from several sources in the following order of importance: (1) Atlantic Coast refineries utilizing domestic crude, (2) Gulf Coast refineries, and (3) California refineries. These domestic products meet the competition of similar products (1) made by domestic refineries on the Atlantic Coast from imported crude oil, chiefly Maracaibo, and (2) imported from foreign refineries, chiefly in the Netherland West Indies. Of the total supply of gasoline in the Atlantic Coast area (some of which is exported to foreign countries) it is estimated that about 16 per cent is of foreign origin, of kerosene about 6 per cent, and of gas and fuel oil about 49 per cent.

The cost of crude petroleum, including transportation to the refinery, represents much the greater part of the total cost of finished petroleum products, the expense of processing being a much smaller item. For the domestic refineries using principally domestic crude, the cost of crude petroleum during 1929 and 1930 represented 63 per cent of the total cost of the finished products.

### Cost of Products

The costs of the finished products of petroleum may be considered from two different standpoints. On the one hand, from the standpoint of the refining concern (particularly if it be not also a producer of crude petroleum), the costs of the finished products depend largely on the price paid for crude oil. On the other hand, if the purpose is to correlate the difference between domestic and foreign costs of finished products to the difference between domestic and foreign costs of crude petroleum, the item of crude petroleum in the costs of refined products should be computed on the basis of the actual costs of production of the crude oil (including interest on investment at 6 per cent). It has been assumed by the commission that costs computed from the second of these standpoints were of particular interest to the Congress and to the petroleum industry. Consequently the cost comparison summarized below is made by adding the cost of the refining operation to the ascertained costs of production of crude petroleum, including delivery to the refineries.

The major refined oils—gasoline, kerosene, gas and fuel oil, and lubricating oils—are joint products derived by fractionating the same crude material. From

one point of view all the different products cost approximately the same per gallon, the only difference being in the expense of certain special processes applied to this or that product. Since, however, the several products command very different prices, a more significant method of determining their costs consists in allocating to each product a share of the cost of the crude material, and also of the cost of those processes which apply to the crude material as a whole, according to the net value of the respective products. This method has been pursued by the commission. In fact, for the purpose of ascertaining general average costs, it was found necessary, on account of the differences in the accounting methods of the different refining concerns, to allocate all the costs of refining as well as that of crude material according to the value of products, notwithstanding that certain of the expenses are connected only with one or another of these products. It was found, by working out both methods, for a number of the large refineries, that this method of calculating costs gives substantially the same results as a method which allocates only the joint costs according to value of products, adding for each individual product the separable costs which relate thereto.

**Combined Data**

In order to avoid the indirect disclosure of the operations of certain individual refineries, the commission found it necessary, in calculating the costs of the finished products derived from foreign crude oil, to combine the data for refineries situated in foreign countries with those for refineries in the United States which use exclusively or predominantly foreign crude. It is believed that the comparison between the costs of products from domestic crude, and those from foreign crude computed in this manner, is the most significant comparison for the purposes contemplated by the resolution under which the investigation was undertaken.

The Atlantic Coast area being the only region in which foreign products of petroleum compete to any significant extent with domestic products, costs have been computed on the basis of products refined in or shipped into that area. The average for domestic costs covers (a) refineries on the Atlantic Coast whose raw material is 70 per cent or more of domestic origin, (b) refineries in other parts of the United States. The costs for refineries in each region are weighted in the general average according to the shipments from that region to the Atlantic Coast area and including the cost of transportation to that area. Similarly, the costs for the products of foreign crude represent (a) domestic refineries whose raw material is 70 per cent or more of foreign origin, and (b) refineries in foreign countries using entirely foreign crude; the costs for each foreign country being weighted according to its production, and including cost of transportation to the Atlantic Coast area. The admixture of foreign crude in the domestic costs, and the admixture of domestic crude in the foreign costs, are so insignificant as to have practically no effect on the averages. The domestic costs are dominated by the figures for the Atlantic Coast and Gulf refineries and the foreign costs are dominated by the figures for the Atlantic Coast and Netherland West Indies refineries.

The analysis made in the manner thus described showed for the two years 1929 and 1930 the results, in Table 1, independently of any adjustment for possible difference in quality of the domestic and foreign products.

TABLE 1

| Product— | Domestic costs | Foreign costs | Excess of domestic costs |
|---|---|---|---|
| 1929 | Cents per gallon | | |
| Gasoline | 7.71 | 7.21 | 0.50 |
| Kerosene | 6.07 | 6.10 | —.02 |
| Gas and fuel oils. | 2.63 | 3.14 | .49 |
| | Dollars per bbl. of 42 gals. | | |
| Gasoline | 3.24 | 3.03 | .21 |
| Kerosene | 2.55 | 2 56 | —.01 |
| Gas and fuel oils. | 1.10 | .90 | .20 |
| 1930 | Cents per barrel | | |
| Gasoline | 7.62 | 6 70 | 0.92 |
| Kerosene | 5.87 | 5.78 | .09 |
| Gas and fuel oils. | 2.82 | 2.22 | .60 |
| | Dollars per bbl. of 42 gals. | | |
| Gasoline | 3.20 | 2.81 | 0.39 |
| Kerosene | 2.47 | 2.43 | .04 |
| Gas and fuel oils. | 1.18 | .92 | .26 |

In the above comparison the costs of premium gasoline have been excluded. The costs of lubricating oils are not compared because of the great difference in quality and the fact that there was relatively little production from the foreign crude. There is some variation in the quality of the gasoline and kerosene produced by different refineries but the commission finds that, broadly speaking, the average quality of the foreign product is substantially similar to that of the domestic product. The same can not be said, however, with respect to gas and fuel oils. There are a number of grades of these but the cost accounts of the refineries are not such as to permit a separate calculation of the costs of each grade. There is evidence that, on the whole, the average quality of the gas and fuel oils produced from domestic crude is somewhat higher than that of the same products from foreign crude as measured by average sales value of the product. The commission has been unable, however, to measure the value of this difference in quality.

It should be borne in mind in interpreting this cost comparison that the figures represent, as already stated, the costs of production and transportation of the crude petroleum (not the costs incurred by the refiners on the basis of the prices paid by them for crude petroleum) to which have been added the costs of refining.

Attention is called, also, to the fact that to whatever extent the domestic costs of crude petroleum are higher or lower by reason of the inclusion of pipe line charges instead of actual costs of pipe line transportation, the costs of the domestic finished products are also affected.

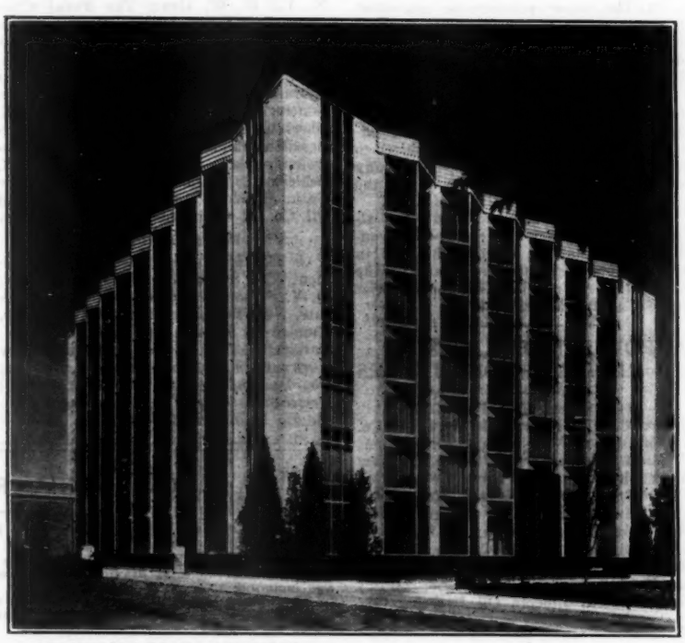
**General Statistics**

In addition to the data on which the cost comparisons for crude and refined products are based, the commission presents for the convenience of the Congress and the public a body of statistical information regarding the petroleum industry. This information includes, among other things, the costs of production of crude petroleum in regions which supply little, if any, crude oil or refined products to the Atlantic Coast area, together with averages for the United States as a whole. Similarly, costs of the refining process and of refined petroleum products are shown for all the different regions of the United States, these costs, however, being based, not on the cost of production of the crude oil but on the prices paid for it by the refineries. The report also contains statistics covering, for a series of years, world production and domestic production of crude petroleum, domestic production of the refined products, and the export and important trade in both crude petroleum and its products.

These statistics show that at all times during the past 15 years or more the imports of crude petroleum have much exceeded the exports, but that, on the other hand, the exports of refined petroleum products have been many times greater than the imports. Taking both the crude oil and its products, the exports have, except during three or four years in the earlier part of the last decade, materially exceeded the imports in quantity, and in every year they have greatly exceeded the imports in value. During the two years 1929 and 1930 the domestic production of crude petroleum averaged 952,000,000 bbls. annually, the imports of crude 70,500,000 bbls., and the exports 25,000,000 bbls. The exports of the major liquid refined products averaged 129,500,000 bbls. and the imports 36,000,000 bbls. The exports of crude and refined products together during this period averaged 155,000,000 bbls. and the imports 107,000,000 bbls. The value of the exports of crude petroleum and its principal refined products during 1929 and 1930 averaged $501,000,000, whereas the corresponding value of imports was $142,000,000.

The statistics also show that the United States during the past 15 years taken together has produced from two-thirds to seven-tenths of the world total output of crude petroleum. The proportion has declined somewhat in the last few years. In 1930 the share of this country in world production fell to 63.7 per cent. In that year Venezuela was the second largest producer with 9.7 per cent of the world total, and Russia third with 8.9 per cent.

## BUILDING FOR INVENTION AND DISCOVERY COMPLETED



Consolidation of all engineering, research and experimental activities of the A. O. Smith Corp. is effected with completion of that company's seven-story building in Milwaukee, Wis. Eventually, according to plans of the company, some 1,000 engineers and scientists, specialists in their various fields, will carry on the engineering work as well as invention and discovery. The staff already built up has developed the modern pipe mills, the automatic frame plant and the welding plants of the A. O. Smith Corp., besides contributing much to the scientific information and working principles of industries served by the organization.

Departing from conventional practice in many respects, the new building was planned to provide a maximum of light, air and space and to afford either unobstructed space or a series of many small offices on each floor. The unusual appearance of the building is the result of a design worked out to give the best possible interior working conditions. The windows on every wall are fixed, and on three sides the walls are almost entirely of glass. The ventilation, mechanical throughout, is combined with a system of heating and air conditioning.

The space required for the different kinds of work to be performed led to the allotment of two floors for electrical and mechanical research, three for engineering design and two for chemical laboratories. A basement under the entire building and an attic floor provide space for heating and ventilating equipment, electrical substation and equipment, pumps, heaters and auxiliary equipment, horizontal space for ducts and pipe lines, as well as ample space for materials and equipment required in the laboratories.

Because of the changeable nature of the occupancy layouts no permanent partitions were built except in the service portions of the building, which is U-shaped and about 170 feet wide. The arms and base of the U are 45 feet wide from center to center of columns, with a width in the court of 80 feet. As all interior columns were omitted, the floor space of each wing on each floor is approximately 45'x185'. These areas can be left open as large drafting rooms or subdivided with movable partitions in any manner that the work may require.

## FAVORABLE PRODUCTION OUTLOOK IN 1932

(Continued from Page 18)

such manner and proportion as they may from time to time agree upon. If the area is incapable of producing 7,000 bbls. per day the allowable may be reduced by the commission.

Outside the Silicious lime area in the Oklahoma City Field each well not illegally overproduced, and which has served its 65-day shut-in period, shall be permitted to produce 50 bbls. per day, and in addition 3 per cent of its current potential as determined by the commission.

Wells outside the Silicious lime area in the Oklahoma City Field that are underproduced or under-run as of the first day of any month after 7 a.m. on January 1, shall, in addition to any other quantity permitted under the order, be allowed to produce and run each day during such month that proportion of 16,000 bbls. which the underproduction bears to the total underproduction or under-run of such wells at the time.

**Regulating Kansas**

The job of keeping production in Kansas down to 100,000 bbls. per day should not be difficult. The Kansas Public Service Commission finds that the actual demand for crude in that State runs around the 100,000-bbl. mark, and as the pipe line facilities into the new fields of central and west central Kansas do not compare in capacity with facilities accorded the older fields of the State there can be no great overproduction and with the co-operation of some of the largest producers in the newer fields already offered the commission it is regarded as quite likely that Kansas will not upset the work of stabilizing Mid-Continent production to demand for the crude from that immense area.

**Texas' Prompt Response**

Texas gave the industry a glad surprise by reducing production nearly 104,000 bbls. per day last week, the largest decline being in East Texas where a drop of about 65,000 bbls. per day was noted. Governor Sterling's order limiting production in the East Texas area to 100 bbls. per day per well, together with the prompt action of many oil companies in closing down all producing operations on Sunday, December 20, combined to pare production far below what the most san-

guine conservationist expected in so short a time. Some of the Texas companies engaged in the Sunday shutdown movement also produce in Louisiana and New Mexico and the production in these states showed the effect of the one-day layoff.

Just what effect the program will have should become known by January 9, when the first week's curtailed production will have been compiled. It is hoped to bring crude output to below the 2,200,000-bbl. mark and as near the 2,100,000-bbl. mark as possible. In January, 1931, production in the United States averaged 2,001,565 bbls. according to The Oil and Gas Journal's figures, which was the low point for many months past, but at that time East Texas was hardly in the picture. That the rest of the oil country has made great sacrifices in order that East Texas could throw its cheap oil on the market may be seen from the fact that in mid-December, 1930, the production of all the fields excepting East Texas was 2,201,874 bbls. while in the midweek in December, 1931, the production of the same fields was 2,038,354 bbls., a decline in one year of 164,407 bbls. per day, much of which was voluntary or enforced curtailment in fields outside the East Texas Field. Meanwhile the East Texas Field has been permitted to pour out 100,000,000 bbls. of oil, or an average of 285,000 bbls. per day from January 1 to December 16 of this year.

## EDWARDS PLATEAU AREA HAS POSSIBILITIES

(Continued from Page 17)

deep, but to the west in Schleicher County four tests went below 5,000 feet, one of them to 5,745 feet and one to 6,880 feet, and there is no report of their running into Ellenberger or granite.

**Kimble County**

In southwestern Kimble County, the Transcontinental Oil Co.'s (Delvatex's) No. 1 Patterson got salt water at the contact of the Ellenberger, but had some showings of oil at 2,950 feet, 3,760 feet and 3,894 feet, the last in the Marble Falls lime.

The Brazos-Menard in North Central Menard County had a show of gas at 1,456 feet. Dixie's No. 1 Bode started in the upper Pennsylvanian and topped the Bend at 2,760 feet.

Priest's No. 1 Allison in eastern Sutton County had showings at 3,168 feet, 3,475 feet, 3,595 feet, 3,625 feet, 3,685 feet and 3,925 feet.

**Schleicher County**

In Schleicher County the Gray Robinson test had showings of oil or gas at 2,050 feet, 2,700 feet, 2,770 feet, 2,900 feet and 3,000 feet.

Indian Territory's No. 1 O'Harrow showed oil at 2,380-85 feet and salt water at 2,610 feet, 2,740-55 feet and 3,325-30 feet.

Teas & Gant's No. 1 Allison showed gas at 2,090-2,100 and oil at 2,200 feet.

Phillips-Interstate's No. 1 Whitten topped the Penn at 665 feet with an elevation of 2,333 feet and showed gas and oil at 6,305 feet and 6,321 feet and at 6,350-53 feet had an estimate of about 15 bbls. a day of high gravity oil.

## OIL SECURITIES ARE THOROUGHLY DEFLATED

(Continued from Page 104)

paid, say, 16 cents the refiner has this year received about 4 cents at the point of manufacture. During this year gasoline has brought the refiner less than the amount of the 5-cent gasoline tax in Oklahoma. Half a billion dollars of the amount the public paid for gasoline in 1931 represented taxes levied by the states, being an increase of $350,000,000 in the past five years.

"One dollar a barrel for crude oil may be all right—perhaps $2 for that matter. It must, however, be remembered that it has been a long time since refined prices represented a fair return on the cost of crude oil. Until refined prices do adequately reflect the present price of crude the industry will not be on a satisfactory earning basis. And of course no increase from present crude price levels can be expected under these circumstances. There is reason to hope that correction of this maladjustment will not be much longer postponed."

**Pacific Public Service**

A dividend of 32½ cents per share has been declared upon the outstanding first preferred stock of Pacific Public Service Co., payable on February 1, 1932, to first preferred stockholders of record January 15, 1932.

## EXPLAIN NECESSITY OF SEASONAL CHANGES

(Continued from Page 103)

out of their required amount of fuel; in other words, the mixture is too lean and the motor will not idle.

"Shell has carefully studied this point and as a result has adopted for some years the practice of regulating startability, at the same time eliminating tendency to gassing, by adjustment of the two factors. To produce ease of starting, the volatility characteristics are made to vary inversely with the prevailing atmospheric temperature. This means:

"1. That the vapor pressure is adjusted so that the initial firing of the gasoline takes place with the greatest possible ease and with the minimum use of battery and self-starter.

"2. That the volatility is increased so as to require the minimum use of choke at all seasons while the engine is warming up.

"3. The vapor pressure is controlled, however, so as to eliminate the possibility of gassing and stalling the motor under the most severe driving conditions likely to be met.

"There is a distinct difference in performance of the same gasoline at different altitudes—thus a gasoline used satisfactorily at sea level will be subject to gassing at high altitudes. With many gasolines it becomes necessary to use the choke when driving in the mountains.

"Shell gasoline is blended so as to allow for these varying geographical conditions, so that at all altitudes and in all climates it meets every need of the automobile engine and gives the motorist perfect performance."

## APPOINT INSTITUTE'S REFINING COMMITTEES

(Continued from Page 97)

geles; C. K. Hewes, Richfield Oil Co. of California, Wilmington, Calif.; C. A. Johnson, Vacuum Oil Co., Inc., New York; E. M. Keely, Crew Levick Co., Philadelphia; O. P. Keeney, Keeney Oil Co., New York; A. R. Lange, Swan-Finch Oil Corp., Newark, N. J.; E. R. Lederer, Texas Pacific Coal & Oil Co., Fort Worth, Tex.; Zeno LeTellier, Lindsay-McMillan Co., Milwaukee, Wis.; R. E. Luton, Lincoln Oil Refining Co., Robinson, Ill.; A. G. Marshall, Shell Oil Co., San Francisco; R. R. Matthews, Battenfeld Grease & Oil Co., Kansas City, Mo.; E. B. McConnell, Standard Oil Co. of Ohio, Cleveland; Gordon McIntyre, Imperial Oil Refineries, Ltd., Sarnia, Ontario, Canada; A. E. Miller, Sinclair Refining Co., New York; Walter Miller, Continental Oil Co., Ponca City, Okla.; L. Mittelman, Associated Oil Co., Associated, Calif.; D. W. Monroe, British American Oil Refineries, Ltd., Montreal, Province of Quebec; G. G. Oberfell, Phillips Petroleum Co., Bartlesville, Okla.; R. C. Osterstrom, Pure Oil Co., Chicago; L. W. Parsons, Tide Water Oil Co., Bayonne, N. J.; H. B. Pullar, James B. Berry's Sons Co., Inc., Chicago; J. B. Rather, Standard Oil Co. of New York, Brooklyn; T. H. Rogers, Standard Oil Co. (Indiana), Whiting, Ind.; Herschel G. Smith, Gulf Refining Co., Philadelphia; J. B. Terry, Standard Oil Co. of California, Richmond, Calif.; S. Tijmstra, Shell Petroleum Corp., St. Louis, Mo.; E. R. Wiles, Barnsdall Refineries, Inc., Barnsdall, Okla.; W. S. Zehrung, Pennzoil Co., Oil City, Pa.

**Motor Fuel Research**

R. P. Anderson, American Petroleum Institute, New York, chairman; D. P. Barnard, Standard Oil Co. (Indiana), Whiting; A. L. Beall, Vacuum Oil Co., New York; Sydney Bevin, Tide Water Oil Co., Bayonne; H. W. Camp, Empire Oil & Refining Co., Tulsa; A. Ludlow Clayden, Sun Oil Co., Detroit; Graham Edgar, Ethyl Gasoline Corp., Yonkers, N. Y.; G. W. Gray, The Texas Company, New York; J. Bennett Hill, Atlantic Refining Co., Philadelphia; C. O. Johns, Standard Oil Development Co., New York; George R. Lord, Sinclair Refining Co., New York; Walter Miller, Continental Oil Co., Ponca City; G. G. Oberfell, Phillips Petroleum Co., Bartlesville, Okla.; T. B. Rendel, Shell Petroleum Corp., Wood River, Ill.; C. H. Schlesman, Standard Oil Co. of New York, Brooklyn; J. B. Terry, Standard Oil Co. of California, Richmond, Calif.

**Fire Prevention in Refineries**

C. H. Haupt, Standard Oil Development Co., Elizabeth, N. J., chairman; D. V. Stroop, American Petroleum Institute, New York, secretary; H. W. Camp, Empire Oil & Refining Co., Tulsa; D. W. Carswell, The Texas Company, New York; C. J. Cutting, Atlantic Refining Co., Philadelphia; S. J. Dickey, General Petroleum Corp., Los Angeles, Calif.; H. H. Hall, Standard Oil Co. of California, San Francisco; William Hildebrandt, Bartles-Maguire Oil Co., East Chicago, Ind.; L. D. Jurs, Associated Oil Co., San Francisco; W. W. Lowe, Henry L. Doherty & Co., New York; L. G. Metcalf, Union Oil Co. of California, Los Angeles; Walter Miller, Continental Oil Co., Ponca City; E. D. Seymour, Vacuum Oil Co., New York; C. W. Smith, Standard Oil Co. (Indiana), Chicago; D. E. Sullivan, Pure Oil Co., Chicago; N. W. Thompson, Shell Oil Co., San Francisco; T. D. Tifft, Sinclair Refining Co., New York; C. E. Townsend, Sun Oil Co., Philadelphia.

**Accident Prevention in Refineries**

C. W. Smith, Standard Oil Co. (Indiana), Chicago, chairman; H. N. Blakeslee, American Petroleum Institute, Dallas, Tex., secretary; J. C. Bernd, Sinclair Refining Co., East Chicago, Ind.; R. W. Black, Standard Oil Co. of New Jersey, Elizabeth, N. J.; S. W. Candee, Tide Water Oil Co., New York; C. W. Coleman, Gulf Refining Co., Port Arthur, Tex.; V. R. Currie, The Texas Company, New York; H. E. Dischinger, Shell Petroleum Corp., St. Louis; R. E. Donovan, Standard Oil Co. of California, San Francisco; J. H. Herbert, Standard Oil Co. of Ohio, Cleveland; E. B. Kershner, Empire Companies, Tulsa; W. C. Lynch, General Petroleum Corp., Los Angeles; S. H. McKenty, Atlantic Refining Co., Philadelphia; Ray E. Miller, Natural Gasoline Association of America, Tulsa; A. A. Odell, Barnsdall Refineries, Inc., Tulsa; G. F. Prussing, Union Oil Co. of California, Los Angeles; C. L. Swim, Skelly Oil Co., Tulsa.

**Corrosion of Refinery Equipment**

Walter Samans, Atlantic Refining Co., Philadelphia, chairman; D. V. Stroop, American Petroleum Institute, New York, secretary; J. E. Biggins, Gulf Refining Co., Philadelphia; E. S. Dixon, The Texas Company, Port Arthur; A. E. Harnsberger, Pure Oil Co., Chicago; C. H. Haupt, Standard Oil Development Co., Elizabeth, N. J.; K. V. King, Standard Oil Co. of California, San Francisco; L. G. Metcalf, Union Oil Co. of California, Los Angeles; N. B. Musser, Sun Oil Co., Marcus Hook, Pa.; C. J. Nobmann, Shell Oil Co., San Francisco; L. W. Parsons, Tide Water Oil Co., Bayonne; J. B. Rather, Standard Oil Co. of New York, Brooklyn; E. D. Seymour, Vacuum Oil Co., New York; S. S. Shaffer, Humble Oil & Refining Co., Baytown, Tex.; Thomas D. Tifft, Sinclair Refining Co., New York; W. G.

## CALIFORNIA CRUDE OIL PRICES

(Continued from Page 101)

**ASSOCIATED OIL CO. PRICES**

Associated Oil Co. prices effective June 20 are as follows:

Ventura Avenue, 23 gravity, 58 cents, with 2 cents added for each degree upward to and including 30 gravity, which is 74 cents.

Kettleman Hills, 30 gravity and above, 66 cents.

Potrero, 24 gravity, 69 cents, with 2 cents added for each degree upward to 34 gravity which is 69 cents.

**UNION OIL CO. OF CALIFORNIA**

**Crude Oil Prices for Its Purchases at the Well for Crude Produced in Strict Accordance With the Production Allocations Made by the California Statewide Curtailment Committee Effective 7 a.m., June 20, 1931**

(All gravities above those quoted take highest price for that field)

| Gravity °A.P.I. | Signal Hill | Alamitos Heights, Seal Beach | Huntington Beach | Athens, Rosecrans, Dominguez | Torrance | Santa Fe Springs | Playa Del Rey* | E. Coyote, Richfield | Montebello | Santa Paula | Orcutt | Coalinga | Lost Hills | McKittrick, Kern River, Sunset-Midway, Elk Hills, Buena Vista Hills | Gravity °A.P.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11-13.9 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | $.50 | 11-13.9 |
| 14-14.9 | $.65 | $.65 | $.65 | .... | $.65 | .... | .... | $.65 | $.65 | $.65 | $.55 | $.55 | $.55 | .55 | 14-14.9 |
| 15-15.9 | .65 | .65 | .65 | .... | .65 | .... | .... | .65 | .65 | .65 | .55 | .55 | .55 | .55 | 15-15.9 |
| 16-16.9 | .65 | .65 | .65 | .... | .65 | .... | .... | .65 | .65 | .65 | .55 | .55 | .55 | .55 | 16-16.9 |
| 17-17.9 | .65 | .65 | .65 | .... | .65 | .... | .... | .65 | .65 | .65 | .55 | .55 | .55 | .55 | 17-17.9 |
| 18-18.9 | .65 | .65 | .65 | .... | .65 | .... | .... | .65 | .65 | .65 | .55 | .55 | .55 | .55 | 18-18.9 |
| 19-19.9 | .65 | .65 | .65 | .... | .65 | .... | $.65 | .65 | .65 | .65 | .55 | .55 | .55 | .55 | 19-19.9 |
| 20-20.9 | .65 | .65 | .65 | .... | .65 | .... | .65 | .65 | .65 | .65 | .56 | .55 | .55 | .55 | 20-20.9 |
| 21-21.9 | .65 | .65 | .65 | .... | .65 | .... | .66 | .66 | .65 | .65 | .57 | .55 | .57 | .55 | 21-21.9 |
| 22-22.9 | .65 | .65 | .65 | .... | .66 | .... | .67 | .67 | .65 | .65 | .59 | .55 | .59 | .56 | 22-22.9 |
| 23-23.9 | .67 | .67 | .67 | .... | .67 | .... | .68 | .68 | .65 | .65 | .61 | .55 | .60 | .58 | 23-23.9 |
| 24-24.9 | .69 | .69 | .69 | $.69 | .68 | $.65 | .69 | .69 | .65 | .66 | .63 | .55 | .63 | .61 | 24-24.9 |
| 25-25.9 | .71 | .71 | .71 | .71 | .70 | .65 | .70 | .70 | .65 | .68 | .65 | .57 | .64 | .64 | 25-25.9 |
| 26-26.9 | .73 | .73 | .73 | .73 | .... | .65 | .... | .72 | .... | .70 | .67 | .... | .66 | .66 | 26-26.9 |
| 27-27.9 | .75 | .75 | .75 | .75 | .... | .68 | .... | .74 | .... | .72 | .... | .... | .67 | .68 | 27-27.9 |
| 28-28.9 | .77 | .... | .... | .77 | .... | .71 | .... | .... | .... | .74 | .... | .... | .69 | .71 | 28-28.9 |
| 29-29.9 | .79 | .... | .... | .79 | .... | .73 | .... | .... | .... | .76 | .... | .... | .71 | .74 | 29-29.9 |
| 30-30.9 | .81 | .... | .... | .81 | .... | .75 | .... | .... | .... | .78 | .... | .... | .73 | .76 | 30-30.9 |
| 31-31.9 | .... | .... | .... | .83 | .... | .78 | .... | .... | .... | .... | .... | .... | .... | .... | 31-31.9 |
| 32-32.9 | .... | .... | .... | .85 | .... | .80 | .... | .... | .... | .... | .... | .... | .... | .... | 32-32.9 |
| 33-33.9 | .... | .... | .... | .87 | .... | .82 | .... | .... | .... | .... | .... | .... | .... | .... | 33-33.9 |
| 34-34.9 | .... | .... | .... | .89 | .... | .85 | .... | .... | .... | .... | .... | .... | .... | .... | 34-34.9 |

*Subject to a gathering charge of 5 cents per barrel.

Whitman, Standard Oil Co. (Indiana), Whiting.

**Disposal of Refinery Wastes**

John S. Hess, Sinclair Refining Co., New York, chairman; D. V. Stroop, American Petroleum Institute, New York, secretary; H. W. Camp, Empire Oil & Refining Co., Tulsa; John Carlstrom, The Texas Company, Port Arthur; W. B. Hart, Atlantic Refining Co., Philadelphia; L. G. Metcalf, Union Oil Co. of California, Los Angeles; W. E. Soden, Sun Oil Co., Marcus Hook, Pa.; E. E. Swope, Magnolia Petroleum Corp., Beaumont, Tex.; G. H. van Senden, Shell Oil Co., San Francisco; C. L. Waite, Standard Oil Co. of New Jersey, New York; G. W. Watts, Standard Oil Co. (Indiana), Whiting; G. H. Westbrook, Gulf Refining Co., Port Arthur.

## DEVELOPING NEW GAS FIELD NEAR CORNING

CORNING, N. Y., Dec. 26.—The Tri-State Gas & Electric Co. has leased enough additional acreage in the Rathbone gas field in Steuben County to make up a block of about 5,000 acres. The company has drilled two wells in the field good for a total of 5,000,000 feet of gas. There are four gas wells in the area, two of which are on the Dorr T. Martin farm. The sand lies at about 750 feet and is about 300 feet in thickness. It is not the Oriskany sand, from which most of the gas in the New York-Pennsylvania gas field is recovered. The field is located about 15 miles west of Corning.

## OKLAHOMA GASOLINE PRICE SLUMP STOPPED

(Continued from Page 12)

been an increase in fuel inventories over the past year.

**Mid-Continent Situation**

The Mid-Continent statistical position is not as favorable as most of the other refining areas. As shown in the table Mid-Continent refiners as a group are running 13,000 bbls. less crude oil daily to their stills but their inventories of gasoline and fuel oil and gas oil are considerably higher. The gasoline stocks on December 19 totaled 5,173,000 bbls., which is almost 900,000 bbls. greater than the 4,289,000-bbl. total on December 20 of last year. It is useless to deny that this 37,000,000 gallons of extra gasoline at the start of the season of minimum gasoline consumption constitutes a serious menace to the stability of the gasoline tank car market. January, February and most of March are normally a period of increasing gasoline inventories and with large stocks to start the year, a distress situation is assured for next spring unless refinery operations are quickly curtailed.

The situation is particularly bad in the Oklahoma, Kansas and Missouri area, stocks, according to the table, being 696,000 bbls. greater than last year. In inland Texas the increase is 315,000 bbls. The stocks of North Louisiana and Arkansas refineries show a decrease of 127,000 bbls.

In regard to fuel oil and gas oil the Mid-Continent stocks on December 19 were 178,000 bbls. greater than on the corresponding date of 1930. Stocks were slightly less in the Oklahoma, Kansas and Missouri group and North Louisiana and Arkansas with a 413,000-bbl. increase in inland Texas.

Based on these data the Mid-Continent area needs at least a 40,000-bbl. decrease in daily crude runs to stills during January and February if the gasoline stock situation is to be brought to a healthy status with the start of spring. Such an action would not only assure a recovery from present price levels in gasoline but would also aid the market for other refinery products. The next two weeks should indicate what is to be accomplished in this important phase of the effort being made to prevent a further collapse in the industry's markets.

**Gasoline and Naphtha**

About the only change in the gasoline situation over the past week was the noticeable improvement in inquiries reported by several refiners and marketers the first of the week. Last week the market was exceptionally dull and spot buyers were able to secure material at low prices. However, the number of refiners who are willing to sell gasoline at substantial losses has decreased from week to week and the volume of material now available is relatively small. In two or three cases where refiners have shut down their plants they are not attempting to liquidate their storage at present prices and a large majority of the operating refiners are confining their sales to contract shipments.

On Monday and Tuesday, several refiners and brokers who are active in the spot market reported inquiries from buyers who are willing to buy at present prices for both immediate shipment and delivery over January. It is believed that these inquiries will develop into purchases by the end of the week or early next week. In this connection the blanket increase in freight rates which has been authorized by the Interstate Commerce Commission may become a factor in purchases over the next few days. The tariffs providing for the increases have not been issued but it is generally understood that the increase will be 5 cent per 100 pounds effective January 4. This will amount to about $5 for an 8,000-gallon car of gasoline. This should result in increased shipments from refineries including orders from jobbers who buy on contracts and also stimulate the movement from refineries to company owned bulk stations.

The U. S. Motor grade of gasoline dropped to a low of 2½ cents to the trade the first of the week in Oklahoma (Group 3). Resale material was available as low as 2⅝ cents with one refiner reported to have sold for resale over January at 2¼ cents. As previously explained not more than a half dozen refiners were quoting these low prices, the remainder either having withdrawn from the market or selling at prices which ranged up to 3 cents.

The low for 60-62, 400 end point was 2¾ cents to the trade, 3⅛ cents for 64-66, 375 and 3⅝ cents to 4 cents for 350 and 360 endpoints.

**Natural Gasoline**

Grade AA sold at a low of 1¾ cents in Oklahoma last week with Texas sales for northern shipment made on the same basis. There was sufficient buying at these low levels to absorb the material offered from day to day, one northern refiner purchasing around 100 cars for shipment before the end of the month. On Monday and Tuesday 2 cents was the going market on Grade AA with a 1¾-cent price in North Texas. There was a steady demand for the limited quantity of Grade A available at 2½ and 2⅝ cents. Grades BB and C were not actively traded but sellers were willing to concede at least one-eighth cent a gallon under the Grade AA market.

Effective the first of the year one of the large contracts between a Gulf Coast refiner and an Oklahoma manufacturer expires and the agreement has not been renewed. The movement on some of the other contracts will be substantially less than it was in January of last year. Just what effect this will have on the natural gasoline market remains to be seen. Several of the sellers believe that they will at least be able to equal any advances that materialize in the refinery gasoline market.

**Kerosene and Furnace Oils**

The recent advances in kerosene are being maintained in all Mid-Continent areas. The 41-43 specification kerosene is firm at a price range of 2⅝ to 2½ cents in Oklahoma with the 42-44 water white grade one-eighth cent higher. Another 50-car order for shipment to the coast was reported last week. Additional buying will be needed early in January.

The strength in kerosene has aided the price situation for high gravity distillates used as furnace oils or tractor fuels. The prime white distillate was practically unobtainable in Oklahoma last week for spot shipment with quotations from 2 to 2¼ cents reported. The 32-36 grade of low flash and cold test was still obtainable at a low of 1⅝ cents, although scarce at that price.

**Fuel Oil and Gas Oil**

The dullness in heavy fuels and industrial grades of gas oils has not been changed. There is very little demand for high cold test material, the shipments being confined to southwestern and southern points. In Oklahoma sellers of UGI gas oil were still quoting 1⅝ cents but this price could be shaded at least one-eighth cent in competitive refining areas. High cold test gas oils are being sold in Oklahoma in limited quantities at 1¼ cents.

There was hardly enough spot trading in the regular grades of fuel oil to determine the market. Some market observers believe that the industrial demand will improve after the first of the year to the extent of aiding Mid-Continent prices.

**Lubricating Oils**

There is considerable competition between Pennsylvania and Mid-Continent bright stocks in spot sales and also contracts over next year. With only 2 to 4 cents difference in prices the products from the two areas are actually bringing the same delivered price at some points due to the Pennsylvania advantage in freight rates. It is probable that this situation will result in price adjustments after the first of the year so that a more normal price relationship can be obtained between the Pennsylvania and Mid-Continent products.

Low cold test 200 3 color neutral oil has been reduced from a low of 9 cents to 8½ cents. This is the principal grade in Oklahoma. Oklahoma refiners continue to make shipments of 124-126 wax to exporters at a price of 2⅛ to 2⅛ cents per pound delivered at the coast. Sales for domestic shipment have been made as low as 1⅝ cents basis Oklahoma refineries.

## SUGGEST POSTING OF GASOLINE QUOTATIONS

DALLAS, Tex., Dec. 26.—Tom E. Cranfill, prominent independent Texas operator, suggests that the major companies post gasoline tank car prices in the same manner that they post crude oil prices. According to Mr. Cranfill, the inability to stabilize the gasoline market has had a more depressing effect on the oil business than has the crude oil situation.

"We've been treating the foot of the patient when his heart emphatically needs attention," Mr. Cranfill said. "The producer should not be called upon to bear all the burden of criticism for the ills of the oil industry. The refiner, who continues to run his refineries regardless of conditions, piling up additional gasoline stocks, is contributing in large measure to the present condition of the oil industry.

"We have a posted price for crude and yet the price of gasoline, which controls the entire oil industry, may be determined by five cars of gasoline on which some refiner may cut the then prevailing price half a cent a gallon to sell it in a hurry. He telegraphs a broker in Chicago, offering the gasoline at a lower price than the current market that day. The broker sells it or buys it himself, the deal is reported and the market breaks.

"It's a case of the tail wagging the dog, and just a stump of a tail at that. It isn't most of the gasoline, but only a very small percentage of it, that determines the price of all of it. Why not post a price for it, as the majors have for crude? It would do a great deal toward stabilizing the present somewhat uncertain condition of the oil industry."

Mr. Cranfill, former president of the Independent Petroleum Association of Texas, made it clear that he was talking entirely as an individual. He has no refining interests, but is concerned in getting the industry on a firmer basis. The Sunday shutdown program will aid materially, he believes.

A co-operative organization of independent refiners to stabilize gasoline market conditions also has been suggested, Mr. Cranfill reported. Such a body could decide upon the amount of crude to be refined by the independents, working this out in relationship with the majors. If both groups go ahead with their programs individually, everybody will continue to lose money in refining, it was predicted.

## ALLEN NOW ADVERTISING DIRECTOR OF MARATHON

Effective January 1, 1932, Tom Chris Allen, former vice president and account manager for Rogers-Gano Advertising Agency's Tulsa office, will become advertising director for Marathon Oil Co.,

Tom Chris Allen

refining and marketing subsidiary of the Ohio Oil Co. For the past two years Mr. Allen has handled the Marathon advertising account for the above agency. It was his poster design, entitled "Timed!" that won signal honors at the second annual exhibit of outdoor advertising art, held recently in Chicago.

## INSTRUMENT TELLS WHEN POISON GAS IS PRESENT

The new M-S-A continuous carbon monoxide indicator, put on the market by the Mine Safety Appliances Co., Pittsburgh, Pa., is a portable instrument designed continuously to indicate low concentrations of carbon monoxide in air. This instrument was developed by Dr. Joel J. White, lieutenant commander, bureau of Medicine and Surgery, U. S. Navy; C. E. Earle, chemical engineer, Bureau of Aeronautics, U. S. Navy, and by the Mine Safety Appliances Co. Helpful suggestions were also received from F. A. Smith, chemist, gas laboratory, U. S. Bureau of Standards.

Carbon monoxide, the most treacherous of ordinary poisonous gases, is caused by incomplete combustion of carbonaceous materials and occurs in deadly quantities in the exhausts from internal combustion engines and improperly regulated gas and oil burning appliances. It is also one of the principal constituents of manufactured gas. Being colorless, odorless and tasteless, indication of its presence, particularly in confined spaces, is important.

## IGNITION COIL ANNOUNCED

The United American Bosch Corp. of Springfield, Mass., announces an addition to its high tension ignition coil line. The new coil, designated as the TC-46 series, is furnished for practically all cars. The major features of the regular line are embodied in the new coil. The windings are so balanced that a special condenser is not necessary. Also if the ignition key is left on, the coil will not overheat or burn out. The windings and core are sealed in a metal container, making them impervious to water, dust oil and vibration.

# IMPORTANCE OF COMPLETE RECORDS OF OIL AND GAS DRILLING DATA

By J. G. Montgomery, Jr.
Superintendent, United Natural Gas Co., Oil City, Pa.

One of the most important, yet one of the least emphasized, conditions in the oil and gas industry in Pennsylvania is the complete and permanent recording of data pertaining to that business. This may seem like a very broad statement but when one considers the vast quantity of unrecorded material that was at one time available and that is now lost forever, the situation is significant. When the industry was young, perhaps everyone was an offender, but to continue with such laxity is now beyond excuse.

It is estimated that a total of 400,000 wells have been drilled in Pennsylvania, and of this number approximately 50 per cent are now represented by nothing more than so many holes in the ground. The date, depth, formations, production, and in cases of abandoned wells, even the locations may have been completely lost. To attempt to estimate the amount of money that has been spent in prospecting for oil and gas in areas where this information has not been kept is a difficult task. This situation has resulted in the testing a second and third time to obtain the same data that was available but not recorded in the first tests.

### Location of Well

When drilling an oil or gas well, the location should be properly tied into some permanent markers by means of the necessary directions and distances; so that, after abandonment, its location can be identified even though all physical evidence has been erased. Future operators will then have available the knowledge of its presence and will conduct their activities accordingly. A good example of what the lack of this kind of data may result in is not uncommon.

Recently a stock company leased a tract of land which had been represented to them as having never been drilled upon. On the day when this company's first test was to be drilled in, one of the stockholders who was present for the event accidentally discovered an old abandoned hole nearby. Upon investigations, the locations of 17 other old holes were discovered on the property and instead of being virgin oil and gas territory, the company was in reality drilling on a depleted or barren tract. Thus, because of the lack of proper location records, another sum of money had been wasted. Regardless of the results of the drilling, the location plat should never be destroyed. It may seem inexcusable for a company to have such an experience, but after a section is wooded or cultivated or improved, the surface evidence of a hole is easily lost.

### Log of Formations

In drilling a well in the early days the operator was usually seeking to encounter a certain oil or gas horizon and in reaching the goal little attention was given to the other formations passed through. This situation exists even today, especially in places where the production is obtained mainly from one horizon. Of the great number of wells in the Bradford oil pool, it is surprising to discover what a small proportion have recorded the red rock, pink rock and other formations above the Bradford sand.

For correlating purposes the Catskill red beds and the Chemung pink rock present the best key horizons in the northern part of the State, especially where the Vanport lime, Pittsburgh coal or other persistent coals are absent. Even with this fact known, the drillers' logs do not often show it. During drilling the operators frequently make use of these keys to determine the point at which to set casing and at what depth to expect the producing sand, but in the majority of cases they failed to record these important horizons. The driller's memory is relied upon far too often for this information. It may be that the well was unknowingly stopped just above the pay, and thus the area was condemned. Without a complete log of every foot of the hole, the variation of intervals, the pinching out of sands, the presence of strays, etc., cannot be definitely determined.

The driller has not only had the job of making the hole, but also that of being the geologist. He did the work well, but his information was limited and too much has been expected of him. Naturally, erroneous correlations have resulted. With the advent of the trained geologist, so little real data are available that unfortunately much more money is being spent to recover that which has been passed up formerly. For mapping geological structures, it is imperative that correct depths to key horizons be recorded. No better information is available for this work than complete well logs.

### Incorrect Correlations

There are innumerable examples of incorrect correlation of horizons resulting in the abondonment of holes when production existed just a little deeper. Often this occurred when a stray sand made its appearance, thus causing the driller to think he had encountered the next regular sand. Also because of incorrect correlation or lack of records, many wells have been drilled deeper than necessary to penetrate the productive horizons.

Even in commercially productive holes, the depths of the producing sands in hundreds of wells have not been recorded and preserved. Some have been recorded but lost. It is very often advisable to clean out or repair such a well, but with these essential figures missing it is extremely difficult to properly place a shot or set a packer.

Everyone connected with the oil and gas industry has had told to him by the farmer, landowner, or native, the story of the well drilled down in the field. How it had a nice volume of gas or a good show of oil, but that the operators could not agree; or that the operative company, not wishing to show the real value, plugged the well and pulled out with the intention of coming back at some later time to acquire all of the acreage. There have always been some ready listeners to these stories, and as the result more testing has usually been done. Often this later testing has resulted in failures, and the lack of properly recorded information has again proved costly.

There is little doubt that in the early days while prospecting for oil, commercial quantities of gas were often encountered and due to the lack of market and a fair price, the holes were plugged. Unfortunately, this story has been overworked, and there is no way of distinguishing this hole from the dry one. Since the lack of data cannot be considered to be condemning evidence, it becomes necessary to do more testing in search for the production reported in the earlier prospecting.

### Log of Depths of Production

So often is the operator so anxious in his quest for production that he fails to record the depths at which oil, gas or water is encountered. He does not realize it then, but as time goes on this condition results in much trouble and expense. Even if he records the depths, he may fail to note the amounts of production at each depth. So long as he has a commercial well when he has finished, what should he care about the relative amounts encountered at different points in the hole?

After the well has become defective, it is necessary to clean it out. Perhaps the well does not respond to cleaning, and it is advisable to shoot the sand. Then is the time the record is needed for it is necessary to know the depth the gas is coming in, or it is necessary to know which one of the horizons is the main producing pay. Little benefit can come from shooting if the shot is not properly placed. All sorts of schemes have been devised in attempts to ascertain the points at which the production is entering the hole. These are by no means satisfactory. The resulting loss of money could have been eliminated if, when drilling, a complete record had been kept.

### Log of Drilling Progress

In very close association with the log of formations is the log of drilling progress. The driller's chief aim is to make hole, and he, therefore, is of the opinion that no one but himself is concerned in the fact that he had a crooked hole and that a shot was used to straighten it; or that he drilled up a bailer at this depth or that he sidetracked a bit at that depth The hole is finished to the producing horizon after these difficulties are overcome, and the experiences are forgotten. In later years when excessive wear shows on the pumping equipment, it cannot be explained by the crooked hole. When the well caves, it is not known that the caving has resulted from the shot. When difficulties are experienced in getting the tools or bailer down, the case of the drilled-up bailer or lost bit has been forgotten, and the operators grope for the answer.

A well which at the present time is being drilled deeper is an example of such a situation. Upon exhaustion it was decided to test deeper horizons before abandoning this hole. The meager log reported no trouble in the original drilling, but a bit or other such obstacle is giving no end of trouble in the deepening operation. Had this information been recorded, some other well would have been chosen for testing the deeper horizons rather than spending the money to recover the tools lost in the original drilling.

Again it takes little time to record what material has been used to equip a well, but it is surprising to learn how many are now operating with no record of the amounts and sizes of casing, tubing, packers, liners, perforations, etc. Not only the amounts but also the types and kinds of material are unrecorded. This situation often results in expensive difficulties.

### Initial Open Flows and Pressures

While the open flow alone is no indication of the delivery capacity of a gas well, when it is considered in connection with the rock pressure, the delivery rate against any line pressure can be calculated. Unfortunately these data have not been recorded upon the completion of the well. Initial production and rock pressure figures are very essential in estimating the reserves and depletion sustained in any sand. In planning the proper operating conditions, in buying or selling gas or producing properties, this information is valuable. Not only should it be recorded, but the method of taking the test of a gas well should be noted. So many different methods have been in use that it is confusing, without the proper notation, to determine the correct flow. The tables for the several methods of taking open flows give entirely different amounts, depending on whether a pitot tube or a flow meter was used. Often the flow has been estimated by eye or by the size of the blaze when lighted. Surely this information is important enough to warrant an accurate test with the latest accepted method. To obtain the initial rock pressure, sufficient time, before using, should be allowed to permit the well to pressure up.

Throughout the life of a well, periodic rock pressures, rises above line pressures, volumes of water and oil removed, time the well is used, and such data should be recorded. If this is done, the deliveries at any time can be calculated without actual measurement of the output. It is possible to know at all times when a well becomes defective, when it is exhausted, when it becomes unprofitable to operate, or when the rental should be reduced. Too often wells have been drilled and after completion no further thought is given as to whether or not they are making money. Construction and operating costs are essential for profitable operation. Any amount of evidence is at hand to prove that with the proper care a well will produce until the sand is almost depleted, but unless special attention is given, it will cease to produce prematurely. Without information, the proper care cannot be taken.

### The Abandonment Record

When the useful part of a well's life is past, it should be plugged according to the statute providing for that operation. The improper plugging of wells has been the cause of much additional expense. It may permit the gas to escape; it may allow water to flood the producing sand and thus spoil other wells in that vicinity, or it may allow the gas or air to escape in the case of pressure recovery on oil properties. It seems to have been the custom in the abandoning of wells to drop in anything and everything that was around. In recent years it has become advisable in many cases to open up abandoned holes. This is done in order to test deeper horizons, to properly plug a leaking hole, or to recover the production plugged off and that has now become more valuable. Without a record of the material put in and the positions of the plugs, the cleaning out of an abandoned hole often is very expensive and even impossible.

The writer has endeavored in this paper to point out some of the major omissions in the recording of oil and gas well data with some of the resulting difficulties and expenses. There is little doubt that had the uses of this material been seen, the operators of the past would have recorded it. How fortunate we would be if this information had been kept.

It is now thought that structure and underground temperatures have some relation. As yet little practical value has come from this relation. No one can now tell to what uses this information may be put. A few years in the future we present operators may be criticized just as strongly as our predecessors if we fail to record in addition to the above data, temperatures, crookedness of the holes, fossils present, analyses of the oil, gas and waters encountered, or perhaps even the keeping of the well cutting themselves. Who can determine what information may be essential to the future progress of the industry?

## CLEAVER-BROOKS CO. FORMED.

The Cleaver-Brooks Co. of Wisconsin, a new corporation, will manufacture and market Cleaver tank car heaters, boosters, geysers, and other equipment used for heating all grades of bituminous materials, aggregates and water for central mixing plants, central proportioning plants, large construction work where winter mixing of concrete is carried on, as well as for the furnishing of hot water requirements for industrial plants. J. C. Cleaver is president of the new company, and R. E. Brooks secretary and treasurer. Mr. Cleaver has spent years in the engineering of heating equipment, and has developed several models of machines for unloading bituminous materials from railroad tank cars, manufactured and sold under the name of the J. C. Cleaver Co., Inc., of Oregon, Ill. R. E. Brooks was for years president of the R. E. Brooks Co. of New York. In 1925 he sold his interests in this company to take an executive position in Colgate University, Hamilton, N. Y. In 1929 he became vice president in charge of sales for the National Equipment Co. of Milwaukee, Wis.

## PIONEER REFINER DIES

CHATHAM, Ontario, Dec. 26.—William M. Spencer, ex-mayor of London and a pioneer Canadian oil refiner, died on December 22, aged 79. His father, the late William Spencer, built at Woodstock about 1862 the first oil refinery in Canada known as the Cedar Creek Oil Works. Mr. Spencer learned the refining business at that plant. In 1880 he was one of the founders of the original Imperial Oil Co. at London, Ontario, and its first secretary, the Imperial representing a merger of William Spencer & Sons with other companies. One daughter and one son survive. The latter, Alexander C. Spencer, has been for many years connected with Imperial Oil, Ltd.

## GEOPHYSICAL SOCIETY MEETS AT NEW ORLEANS

The midyear meeting of the Society of Petroleum Geophysicists opened at Tulane University, New Orleans, La., Wednesday afternoon, December 30, in a joint session with the American Physical Society and Section E (geology) of the American Association for Advancement of Science, which had been in session since Monday. While the petroleum geophysical meeting has been confined to Wednesday afternoon, when 13 technical papers have been scheduled on the program, the general session will continue through Friday.

The scheduled program of the geophysical society Wednesday afternoon included the following papers: Eotvos Torsion Balance, by Donald C. Barton, consulting geophysicist, Houston, Tex.; A New Instrument for Measuring Very Small Differences in Gravity, by Kenneth Hartley, Houston; Charts for Torsion Balance Readings, M. M. Slotnick, Humble Oil & Refining Co., Houston; The Calculation of the Motion of the Ground for Seismograph Records, H. A. Wilson, Rice Institute, Houston, Tex.; Amplitude Relations in Seismic Prospecting, W. Maurice Ewing; Asymetry of Sound Velocity in Stratified Geologic Formations, Burton McCollum and F. A. Snell, Houston; Velocity of Elastic Waves in Granite, L. Don Leet of Harvard University and W. Maurice Ewing; The Reflection Seismograph—An Application, Eugene McDermott, Dallas; Seismological Discovery and Partial Detail of the Vermillion Bay Salt Dome, E. E. Rosaire and O. C. Lester, Jr.; Some Special Cases of the Reflection and Refraction of Seismic Waves Between Similar Rocks With Application to the Study of Crustal Layers by Distant Quakes, Louis B. Slichter of Massachusetts Institute of Technology and V. Gabrilovitch Grabriel; The Correlation of Isogeothermal Surfaces With the Rock Strata, C. E. Van Ostrand, U. S. Geological Survey; Geothermal Graolient Determinations in the Lake Superior Copper Mines, L. R. Ingersoll; Electrical Prospecting as Applied in Locating Oil Structures, Leo J. Peters and John Bardeen.

### LEGAL

Sale of Oil and Gas Lease, Department of the Interior, Monroe, Louisiana. Notice is hereby given that the following described land in one unit in the known geologic structure of the Monroe Gas Field, Louisiana, is offered for lease under Sec. 17 of the act of February 25, 1920 (41 Stat. 437), at the customary sliding scale of 12½% to 33⅓% of the quantity or value of the oil produced, of 12½% to 16⅔% of the value of the gas produced, and of 16⅔% of the value of the natural gas gasoline produced, in accordance with the royalty schedule in the regular lease form, and the rental as required by Sec. 17 of the said act: T. 19 N., R. 5 E., Sec. 10, SE¼ SE¼, 39.82 acres; T. 20 N., R. 5 E., Sec. 34, SE¼ SE¼, 40.07 acres; Louisiana Meridian, Louisiana. The lessee will be required to proceed with reasonable diligence to install standard or other efficient drilling outfits and equipment and within three months of delivery of the executed lease to commence drilling one well on each tract of the leasehold. The drilling of each well shall be continued with diligence to production, and thereafter produced, or to a point where the well is demonstrated unsuccessful; and if any well be demonstrated unsuccessful additional wells shall be drilled in lieu thereof until one productive well shall be drilled on each tract or the tract proved barren. Neither more nor less than one productive well shall be drilled on any tract without consent in writing first obtained from the lessor. Beginning with the fourth calendar month after delivery of the lease and continuing until production on nearby lands shall have been fairly offset by production on the leasehold, the lessee shall pay a sum of each tract estimated to reimburse the United States for current loss of royalty therefrom through drainage, the amount of such reimbursement to be fixed monthly by the supervisor of oil and gas operations, subject to the right of appeal to the Secretary, provided that during the last nine months of the first year of the lease such sum is hereby fixed at $25.00 per tract per month. Said lease will be offered for sale by public auction at the west entrance to the Post Office Building, Monroe, Louisiana, at 10 A. M. on January 30, 1932. The successful qualified bidder must deposit on the date of sale with the officer in charge of the sale certified check on a solvent bank, or cash, for one-fifth of the amount bid by him, and file the showing of qualifications to receive a lease required by Section 15 of said regulations. Bidders are warned against violations of the provisions of Section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any or all bids in the discretion of the Secretary of the Interior. James W. Neal, Officer in Charge.

## PRODUCTION OF REFINERY GASES AND SPECIAL OILS SHOWS GAIN

The total production of "other finished products" at petroleum refineries, including all miscellaneous oils other than gasoline, kerosene, gas oil, fuel oil, lubricants, wax, coke, asphalt and road oil, amounted in 1930 to 7,754,000 bbls., as compared with 9,924,000 bbls. in 1929, according to the U. S. Bureau of Mines, Department of Commerce. These data indicate a decline in the production of miscellaneous products but, since road oil, the largest item in the 1929 figures, was classified as a separate product, beginning in 1930, there was actually a material increase recorded in 1930.

From a quantitative standpoint, refinery gas was the most important item. The output of that commodity in 1930, when converted on a B.t.u. basis, amounted to the equivalent of 5,377,000 bbls. of fuel oil. Refinery gas varies widely in B.t.u. content, depending somewhat upon the oils refined and the process used, but principally upon the effort expended in scrubbing the gas in absorbers. According to a survey of a year ago, refinery gas varies in B.t.u. content per cubic foot from 1,100 to 1,600, with an average of approximately 1,400. Assuming an average of 6,000,000 B.t.u. per barrel of oil, the output of refinery gas reported was approximately 23,000,000,000 feet. In general, the refinery gas reported represented gas sold to industrial plants for fuel or to public utility companies for enriching manufactured gas.

The output of petrolatum declined from 251,000 bbls. in 1929 to 246,000 bbls. in 1930. The Appalachian refineries which turned out slightly more than half of the output in 1929, produced 171,000 bbls. of petrolatum in 1930, or the equivalent of 70 per cent of the total for the country.

The output of absorption oils amounted to only 239,000 bbls. in 1930, as compared with 329,000 bbls. the previous year. This material decline placed absorption oils below petrolatum from a quantitative standpoint. Absorption oils are used to absorb the vapors during the treating of natural gas to produce natural gasoline. As would be expected, the production of absorption oils is centered in the Mid-Continent and California districts, the leading natural gasoline producing areas. The exact cause of the material decline in output in absorption oils in 1930 is not known, but it was probably related to the decline in the production of natural gasoline.

The next most important minor product has been designated as special naphthas. These comprise two classes — dry cleaners' naphtha, including Stoddard solvent, and paint thinners, known by a variety of names. The production of special naphthas in 1930 amounted to 226,000 bbls., as compared with 204,000 bbls. in 1929. These figures are, however, believed to represent only a small fraction of the solvent naphthas produced at refineries since the major portions are reported under "gasoline" which is defined as including "naphthas and other products lighter than kerosene."

Another important class among the minor refined products was medicinal oils, the output of which rose from 64,000 bbls. in 1929 to 128,000 bbls. in 1930. This material increase was probably due mainly to changes in classification, for example, a portion of the output in 1929 may have been included under petrolatum, which is often used as the base of various salves and ointments.

The classes above named include only the most important of the minor products made at petroleum refineries. There are several hundred other products which can be made from petroleum but which are not produced in sufficient amount to justify segregating into a separate class. One that was produced at several plants was insecticide, or pest destroyer, a liquid product, usually applied by spraying. A few refineries reported some lubricants separately, for example, black oil, transmission oil, transformer and cutting oils.

**PRODUCTION OF MINOR REFINERY PRODUCTS 1929 AND 1930**
(Thousands of barrels of 42 U. S. gallons)

| | Refinery gas | Absorption oils | Petrolatum | Special naphthas | Medicinal oils | Miscellaneous | Total |
|---|---|---|---|---|---|---|---|
| 1929— | | | | | | | |
| East Coast | 66 | 0 | 23 | 0 | 18 | 1,356 | 1,463 |
| Appalachian | 0 | 4 | 158 | 2 | 0 | 95 | 259 |
| Indiana, Illinois, Kentucky, etc. | 108 | 0 | 51 | 0 | 20 | 1,976 | 2,155 |
| Oklahoma, Kansas and Missouri | 57 | 75 | 6 | 99 | 0 | 472 | 709 |
| Texas | 26 | 73 | 3 | 0 | 0 | 50 | 157 |
| Louisiana and Arkansas | 1,421 | 0 | 0 | 14 | 0 | 1,080 | 2,525 |
| Rocky Mountain | 44 | 0 | 5 | 5 | 0 | 210 | 264 |
| California | 152 | 177 | 0 | 84 | 26 | 1,953 | 2,392 |
| Total | 1,884 | 329 | 251 | 204 | 64 | 7,192 | 9,924 |
| Texas Gulf Coast | 0 | 0 | 8 | 0 | 0 | 35 | 43 |
| Louisiana Gulf Coast | 1,421 | 0 | 0 | 9 | 0 | 1,008 | 2,448 |
| 1930— | | | | | | | |
| East Coast | 191 | 0 | 9 | 0 | 101 | 150 | 451 |
| Appalachian | 29 | 0 | 171 | 0 | 0 | 162 | 362 |
| Indiana, Illinois, Kentucky, etc. | 2,577 | 0 | 44 | 85 | 0 | 92 | 2,798 |
| Oklahoma, Kansas and Missouri | 998 | 71 | 11 | 5 | 0 | 53 | 1,138 |
| Texas | 50 | 143 | 6 | 0 | 0 | 47 | 246 |
| Louisiana and Arkansas | 1,179 | 0 | 0 | 23 | 0 | 366 | 1,568 |
| Rocky Mountain | 214 | 0 | 5 | 0 | 0 | 39 | 258 |
| California | 139 | 25 | 0 | 113 | 27 | 629 | 933 |
| Total | 5,377 | 239 | 246 | 226 | 128 | 1,538 | 7,754 |
| Texas Gulf Coast | 0 | 0 | 6 | 0 | 0 | 31 | 37 |
| Louisiana Gulf Coast | 1,127 | 0 | 0 | 0 | 0 | 348 | 1,485 |

### NEW CATALYSTS IN GERMANY

It is reported by the German press that I. G. Farbenindustrie has improved its methods of cracking petroleum and has worked out a cheaper method of producing gasoline from crude by the use of new catalysts. It is claimed that the cheapening of the process will make it possible to triple the output of the Leuna-Werke, which would mean treatment of over 2,000,000 bbls. of crude a year, beginning next summer.

### PROTEST GASOLINE TAX

The Pennsylvania Grade Crude Oil Association protesting against efforts to increase the tax on gasoline, declared that "gasoline should not bear the burden of providing funds for the relief of distress while other commodities go untaxed."

### INTERNATIONAL OIL COMMISSION

According to a resolution passed at a conference of the International Petroleum Commission at Zurich, Switzerland, the commission will resume its international meetings which were discontinued during the war.

### TANK WAGON CHANGES

(Continued from Page 102)

tion prices in Richmond, Va., to 16.5 and 15.5 cents, respectively, on December 11. On December 10 the station price was reduced to 17 cents in Charlotte, N. C.

Magnolia Petroleum Co., effective December 23, advanced gasoline tank wagon and service station prices 1 cent in Oklahoma and Arkansas. Advance at Muskogee was 3 cents in gasoline tank wagon and 2 cents service station. Same company advanced gasoline tank wagon and service station prices 1 cent in Texas, December 24.

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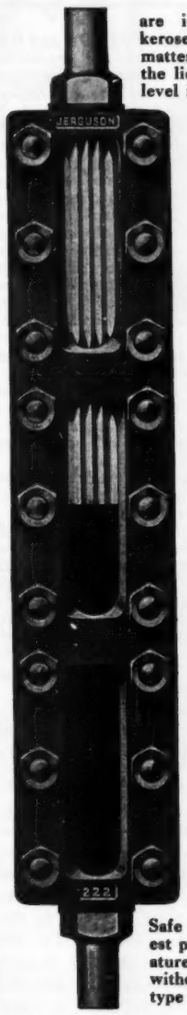

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# Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

*This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.*

*Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.*

*Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.*

*All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.*

*Questions involving patented processes, intricate formulas, and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.*

## GAS OILS FOR FUEL. FUEL OILS AND ROAD OILS

**We find that gas oil distillate fuels and residual fuel oils are separately reported. In 1931 Bureau of Mines began reporting these oils separately as gas oils, distillate fuels and residual fuels. There is no mention as regards the specifications of these residual fuel oils in the whole book as well as issues of The Oil and Gas Journal. We shall be pleased to know whether these residual fuel oils are the same as residual oils or road oils?—V. V. S.**

As is true of all petroleum products, the gas oils and residuals vary in their properties with the charging stock and the refining operation. The gas oils are used for the manufacture of gasoline in pressure stills, especially the grade known as virgin gas oil; for the manufacture of artificial gas, and for burning in domestic units as a source of heat. Virgin gas oil is a primary distillate from crude petroleum which usually is of light specific gravity, low flash and a high percentage of light material as compared with second run and gas oil from a cracked product. The cracked gas oil is well suited to gas manufacture and for use as a domestic fuel. The low pour-point and relatively high flash are important properties particularly desirable for use in domestic heating systems. The gas oil fraction being obtained in the direct distillation of petroleum between kerosene and lubricating distillate, may vary from almost kerosene on the light side to almost lubricating oil for the heaviest grades.

The largest use made of the final liquid residue from the petroleum refinery is for industrial fuel. The properties of this kind of oil are fixed by composition of the petroleum refined, the type of the refinery and the extent to which the lighter products have been removed. As an indication of the quality of fuel oil a glance at the market price table will show oils quoted as ranging from about 10 A.P.I. gravity to nearly 30 A.P.I. gravity. The important properties of this oil include freedom from water and solid matter, high flash, and Furol viscosity or rate of flow through pipe under specified conditions. Close specifications for fuel oil are not necessary and if extensive details are mentioned in a specification, they frequently restrict the source of supply and consequently result in a higher price being demanded.

Road oils should receive more care in the preparation than fuel oil, but some fuel oils are adapted for use as road oils. The residual having properties suitable for road building and maintenance must be one having a high percentage of asphalt with no more than a trace of solid matter. There are numerous grades specified because there are different soil conditions to be considered together with methods of application. An oil that is to be used on the shoulders or simply as a dust palliative need not have the same cementing and binding qualities as one required for road surfacing.

It is apparent that it would not be practical to give in any marketing list all of the specifications that may apply to the several products mentioned. These details must be left to the individuals concerned when the product is desired for a special purpose.

## RHIGOLENE AND VOLATILE PRODUCTS

**Will you kindly advise me where I can find what is called rhigolene crude oil and what are its properties?—A. N.**

During the early days of petroleum refining in Pennsylvania it was noticed that under favorable conditions, especially low temperatures, a very volatile fraction was condensed when the stream first appeared from the condenser. A drop or two of this liquid placed on the hand evaporated with great rapidity and produced a sense of cold. It was found that sometimes this fraction was lighter, 100° to 110° Be., than at others when it varied between 90° and 100° Be., because of the difference in temperature. The lightest material was called cymogene, boiling point about 32° F., and the heavier rhigolene, boiling point about 60° F. We now know that fractions of the indicated range are mixtures consisting essentially of propane, butane and pentane.

Cymogene and rhigolene have been used in refrigerating machines, in medicine as a local anaesthetic for minor surgical operations, and as a solvent for rubber and gums. The recent improvements in the methods for extracting gasoline from refinery gas and natural gas permit the manufacture of volatile liquids which are practically pure hydrocarbons. There is, therefore, little use for such terms as cymogene and rhigolene when words having an exact meaning may be used.

Cymogene and rhigolene are colorless liquids that cannot be more definitely described than as above suggested. The liquefied hydrocarbons propane, butane, and pentane, are well known compounds fully described in the literature and readily obtainable on the market according to detailed specifications. While some quantity of these liquids may be obtained from almost any crude oil which contains gasoline, especially those oils of the higher gravities, they are now produced on the largest scale as by-products in the manufacture of gasoline from gas. Their extreme volatility was found to be the cause of the "wildness" of gasoline and their removal through the use of fractionating towers, stabilizers, has made possible a product of lower vapor tension and consequently less liable to cause annoyance from vapor or gas lock when used as motor fuel.

## OCTANE NUMBER A RELATIVE VALUE

**I am a little hazy in understanding some of the paragraphs contained in the technical articles, due to my limited knowledge of the subject. May I ask regarding a paragraph in the article under "Octane Number of Gasoline Higher" in the issue of November 26, 1931, page 98, which reads, "The Octane numbers of standard mixtures of normal heptane and iso-octane are numerically the percentages, by volume, of iso-octane which they contain. The octane number of a fuel is the octane number of the mixture which it matches in knock value when tested by an approved method." What is meant by standard mixtures of heptane and octane? Is the standard octane number 100 as a basis of comparison of commercial octane numbers? Does it mean that a fuel having an octane number of 70 contains 70 per cent of octane as compared to a standard rating based on a 100 per cent octane volume?—G. W. W.**

The Oil and Gas Journal has published numerous articles in which octane number has been defined. Some reference has been made to the word octane being a new word. This is not true. It is a very old word to the chemist. Certain combinations of carbon and hydrogen form a group of compounds, known as hydrocarbons. The predominating series of these found in petroleum consists of units each of which differs from the nearest member according to the formula $C_nH_{2n+2}$. For example, $C_5H_{12}$ is pentane, $C_6H_{14}$ is hexane, $C_7H_{16}$ heptane, and $C_8H_{18}$ represents octane. It is apparent that these names are derived from a source similar to that from which we have obtained the familiar words pentagon and pentagram, also octagon and octave. All that is meant by the name octane is that it is the hydrocarbon containing eight carbon atoms.

Ever since 1917, when Ricardo directed attention to the fact that the peculiar ping or detonation noticed in the gasoline engine varied with the fuel, efforts have been made to devise methods for measuring this sort of knock and to select some universally acceptable term or standard for expressing it. Chemical analyses and several forms of testing apparatus have been proposed. Progress was made in perfecting a testing engine, but there was considerable difficulty in selecting a standard for comparison.

At the September, 1926, meeting of the American Chemical Society, Dr. Graham Edgar proposed that mixtures of normal heptane and iso-octane were suitable for knock rating standards. These hydrocarbons are very similar in many respects, have almost the same boiling point, heptane boiling at 209.1° F. and octane at 210.7° F., but they differ to a great degree in the tendency to knock when used as a motor fuel. Heptane is a bad knocker, worse than any known gasoline, while octane is practically free from this property. Doctor Edgar explained that it was possible by the use of various mixtures of these two substances to duplicate the knock intensity of any gasoline when tested, or matched, in an engine under identical conditions. For example, a gasoline behaving in exactly the same manner as a mixture of 70 per cent octane and 30 per cent heptane, is graded as equivalent to 70 per cent octane; which, for convenience, is shortened to 70 octane number. Also, a fuel exactly matching octane, 100 per cent, would be graded 100 octane number. This system was officially adopted by the Society of Automotive Engineers May 25, 1930, and is now quite generally used in the United States for expressing the antiknock value of gasoline.

A gasoline having a high antiknock rating, say 70 octane number, does not necessarily contain any octane; however, heptane and octane are hydrocarbons with boiling points within the gasoline range and both of them may be present in a gasoline. There are several substances which will inhibit this fuel knock, some may be naturally present in the gasoline made from a certain kind of petroleum, or they may be built in the refinery, as in the cracking process, and others may be added to the gasoline, an important example of this class being tetraethyl lead. Such gasolines will of course vary in knock and may be classified by comparing their behavior with suitable mixtures of heptane and octane. Octane number is simly an accepted term, a form, or model for measuring the detonating property of a motor fuel; therefore, a standard. It is a model for comparison in the same way that certain standards are used for indicating temperature, heat units, weight, and volume. In other words, an equivalent.

## GRAVITY STANDARD FOR GRADING CRUDE OIL

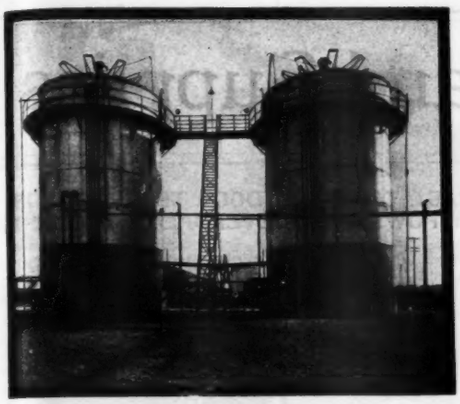
**When oil is purchased on the A.P.I. gravity basis is the same table applied as was in use 10 years ago? If an oil tests 42° at 70° F. is that not a false gravity? Do not pipe line companies purchase only on a true gravity? Do all purchasers of crude oil use the A.P.I. gravity table and is it recognized by the courts as a fair table for the seller and also the buyer?—M. R. R.**

Prior to December, 1921, there had been no official recognition of any system for the determination of the density of petroleum, but the Baume hydrometer for liquids lighter than water was in use. Some companies used an instrument which was graduated to indicate specific gravity, and a few others made use of another hydrometer which was scaled on a somewhat different basis than the Baume instrument. It was to overcome this confusion that caused the American Petroleum Institute in December, 1921, to recommend that the hydrometer scaled to the modulus 141.5 be used in the petroleum industry, to be known as the A.P.I. scale, to clearly distinguish it from the original Baume scale for light liquids. This recommendation has been generally adopted by the industry, the several national societies, the U. S. Bureau of Mines and the Bureau of Standards.

The Bureau of Standards published the National Standard Petroleum Tables, May 29, 1924, as circular of the Bureau of Standards No. 154, giving a history of the matter leading up to the adoption of the modulus 141.5 as the standard. This circular, which may be obtained from the Government Printing Office, Washington, D. C., upon payment of 30 cents, contains the tables required for converting the observed hydrometer indication at any temperature to 60° F.

All petroleum is commonly purchased on the basis of the A.P.I. scale as at 60° F. The practice in the field is for the determination to be made and recorded at the existing temperature, then this is converted to 60° when the report reaches the central office. Payments are then made on the basis of the volume at 60° F. An oil testing 42° A.P.I. at 70° F will show a density of 41.2° at 60° F.

In the absence of a contract mentioning some other basis there can be no other conclusion but that all courts in the United States will recognize the A.P.I. hydrometer scale when the density of petroleum and the various liquid petroleum products may be involved. It is a standard which is honest and consequently fair to both seller and buyer.



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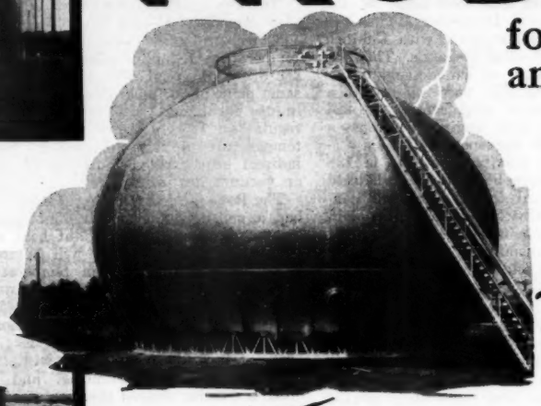

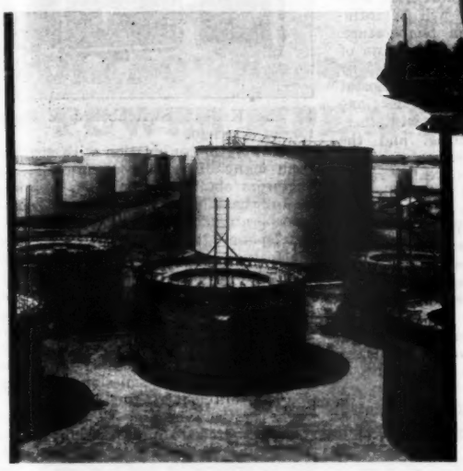

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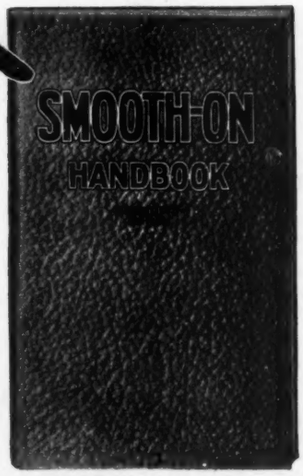


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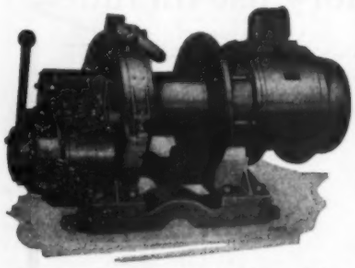
# Oil Industry Equipment and Supplies

## INGERSOLL-RAND ADDING TO ITS LINE OF HOISTS

The Ingersoll-Rand Co., 11 Broadway, New York, has added to its line of portable hoists a nonreversible, single-drum electric hoist designed for many applica-



tions in the mining, contracting and industrial fields. It is modeled after the company's "Utility" hoists, except that it uses an electric motor and friction clutch instead of an air motor and a jaw clutch.

The new hoist is suitable for all single cable work within its capacity such as hoisting timbers, muck, tools and pipe, hauling and spotting cars and for single line scraping. It is made in two sizes. No. 107 is of 7½ horsepower and rated at 2,000 pounds pull at 125 feet per minute. It has drum capacity for 400 feet of one-half inch or 700 feet of three-eighths inch cable. No. 107L is of like power, but has drum capacity for 800 feet of one-half inch or 1,400 feet of three-eighths inch cable. No. 110 has a 10 horsepower motor and is rated at 2,000 pounds pull at 165 feet per minute. The drum capacity is the same as for the No. 107. No. 110L has the same power as the No. 110 and the same drum capacity as the No. 107L.

The new hoists are simple, rugged and compact, are easily operated, have smooth control, and graduation of speed. They have a self-energizing brake for stopping and holding the load and an automatic safety drum lock for added safety when handling suspended loads. Moving parts are protected by dust-proof construction. Bases are drilled and grooved for either column mounting or bolting to a flat surface. Either alternating or direct current motors can be furnished.

## RING ADJUSTS SELF TO TOLERANCE VARIATIONS

The Wedge split chill ring put on the market by Wedge Products, Inc., 5208 Harvard Avenue, Cleveland, Ohio, is offered as embodying practical features of value. On account of the recognized tolerance that exists in piping the Wedge ring, instead of being made solid, is split. This allows it to spring and adjust itself firmly to any variation of inside diameter tolerance.

At the contact points with the pipe the ring has about one-half inch of level surface and a slight bevel to allow easy approach in the pipe. The thickness of the ring is such that it causes less resistance to the flow and yet is of adequate strength to center and line up the pipe. It is still thick enough not to burn through.

The positive stop is narrow, bringing the two ends of pipe in closer contact and lessening the amount of welding rod to be used and the amount of welding time consumed. The inside of the ring is absolutely smooth and level and has chamfered edges. This cuts down the resistance of the flow and offers little or no obstruction to any substance. The ring works with either gas or electric welding. It is made to all sizes.

## HARVESTER COMPANY IS MAKING NEW TYPE TRUCK

Announcement has been made of the new International Harvester Model A-3, six-cylinder, 1½-ton truck, with 136-inch or 160-inch wheelbase chassis. The six-cylinder engine is of the detachable *L*-head type, 3¼-inch bore by 4½-inch stroke. Its piston displacement is 224 cubic inches. This engine develops a maximum brake horsepower of 54 at 2,700 r.p.m. Its maximum torque is 138 pounds at 700 to 900 r.p.m. It is said to be economical in fuel and oil consumption. The clutch is of the single-plate type with built-in, vibration damper, while the transmission provides four speeds forward and one in reverse.

The frame is of heavy pressed steel channels, 7 inches deep at the center and reinforced with numerous cross members which assure rigidity with flexibility to meet varying load and road conditions. The front and rear springs are of the semielliptic type and semielliptic auxiliary rear springs are provided. The rear axle is of the full-floating, spiral-bevel-gear type with axle shafts of chrome-molybdenum steel. Pinion, differential, and wheel bearings are of the tapered roller type. Four-wheel, mechanically operated, internal-expanding, shoe-type brakes and the cam-and-lever steering gear provide easy truck control at all speeds. Cast, spoke-type wheels with 30x5 front and 32x6 rear tires are standard equipment. Dual rear tires are also available.

The South Bend Lathe Works, South Bend, Ind., has prepared a bulletin describing its new South Bend Junior 8-inch bench lathe for small shop use.

## THERMOSTATIC RADIATOR VALVE MADE BY POWERS

The Powers Regulator Co., 2720 Greenview Avenue, Chicago, has added a thermostatic radiator valve to its line of temperature regulators. This device is a self-operated regulator employing the same principle of operation that has been in use for many years in other Powers regulators. It is designed to control the temperature of rooms heated by direct, indirect or concealed radiation of vapor or vacuum heating systems.

The Powers thermostatic radiator valve has a sensitive thermostat that can be located outside of the radiant heat zone of the radiator, where it will be influenced by the actual room temperature.

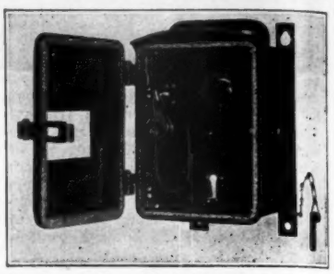
This temperature regulator consists of a diaphragm-operated valve connected by armored flexible tubing to a thermostat which can be obtained in two styles; one enclosed in a thermostat case with thermometer for wall mounting, and the other a tubular shaped thermostat of the bulb type for use with concealed radiation, unit heaters and wall type radiators.

It is asserted that the accurate temperature control gained with this regulator is due to the larger sensitive surface of the thermostat, which is influenced by the room temperature, and to the greater area of diaphragm bellows used to open and close the valve. These features make the action of the regulator more powerful and make it more immune to pressure changes in the steam supply line.

G-E Fabroil gears and gear blanks, G-E Textolite gears and gear blanks, and the CR7006-D40 magnetic switch are the subjects of bulletins recently published by the General Electric Co.

## OUTDOOR TELEPHONE IS DEVELOPED BY KELLOGG

An outdoor telephone, possessing features of interest to oil companies and other industries that seek a weatherproof telephone, has been placed on the market



by the Kellogg Switchboard & Supply Co. of Chicago.

Working in conjunction with engineers from many different companies, Kellogg engineers obtained suggestions and ideas as to what features the new set should incorporate. The final designs resulted in a telephone that is believed to possess the features necessary to meet communication requirements. As outdoor telephones are often used on long, heavily loaded lines where transmission and ringing efficiency are all important, provisions have been made to permit any circuit arrangement necessary to assure high quality of transmission and reception and efficient ringing.

The castiron housing is weatherproof and ventilated to prevent condensation of moisture or "sweating." All parts subject to damage by moisture are treated to withstand outdoor conditions. Iron and steel parts are protected by special moisture-proof finishes. All wires are rubber-insulated, and coils are specially treated to resist moisture. The set has a cast-in shelf upon which three dry batteries may be placed. Ample space is provided for either the standard Kellog five-bar or six-bar generator. This generator is mounted on a sliding Bakelite shelf and can easily be removed for inspection. The induction coil is mounted on another sliding Bakelite shelf upon which space is also available for a condenser when specified. The connecting rack is mounted on the induction coil. Simplified wiring with rubber insulated wire is used throughout. There is no cabling. The door of the iron housing is securely fastened by a locking pin which is attached to the box by a chain. The door swings to the left, permitting free use of the right hand for the operation of the generator crank and other functions. There is ample space for all equipment and all parts are easily accessible.

## VOGT BUILDS GIANT FURNACE FOR STRESS-RELIEVING

What is said to be the largest furnace ever built for stress-relieving is that of the Henry Vogt Machine Co., Inc., Louisville, Ky. This heat-treating structure is 16 feet 9 inches wide and 72 feet long inside. Where localized heat is applied to a vessel, as in welding, thermal stresses unavoidably are set up, and these can be relieved by proper heat treating only. Expert supervision must accompany the process in order to specify the temperature and time required for stress relieving the many shapes, sizes and metal thicknesses of vessels.

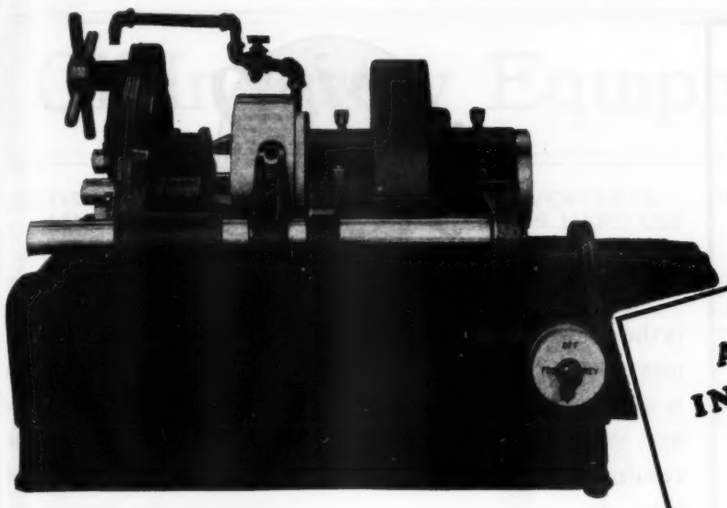
The "Homoweld" developed by the Vogt company is said to unite metals with a dense bond free from harmful defects such as nitride needles, porosity, cracks, slag, segregations, oxides or other flaws. Although special welding quality plate having a high tensile strength is used, the Vogt Homoweld is declared to be even tougher, stronger and more resistant to corrosion Constant supervision, as well as exacting laboratory tests performed during fabrication, and the final test upon completion are designed to preclude possibility of failure in service of any vessel thus treated.

In building the furnace 101,000 fire bricks, 27,000 insulating bricks, 50,000 pounds of cement, 120,000 pounds of steel structurals and 27,000 pounds of steel casing were used. The furnace is served by 48 gas burners.

## MERGES WITH FOXBORO CO.

The Foxboro Co., Foxboro, Mass., and the Wilson-Maeulen Co., Inc., 383 Concord Avenue, New York, have merged the thermometer line of Foxboro and the pyrometer line of Wilson-Maeulen. The entire pyrometer and control business of Wilson-Maeulen will become a division of Foxboro. The Rockwell hardness tester, a mechanical, nonelectrical testing machine, made and sold by Wilson-Maeulen, will continue to be made in the same machine shop and mechanical laboratory as before, and by the same corporation which, however, to avoid confusion, will change its title from Wilson-Maeulen Co., Inc., to Wilson Mechanical Instrument Co.

The Caterpillar Tractor Co., Peoria, Ill., has a new bulletin describing the Sixty and Thirty tractors, designed for oil field and pipe line use.



## "TOLEDO" No. 999 ½ to 2 inch POWER PIPE MACHINE

**$275.00**

**[$288.75 West of Rockies]**

"TOLEDO"

### A POSITIVE REDUCTION IN COST OF THREADING—

—and cutting ½" to 2" pipe.

The "TOLEDO" No. 999 ½" to 2" Portable Power Pipe Machine will without a doubt increase your production and reduce your piping costs. The "TOLEDO" No. 999 threads 2" pipe in 30 seconds, cuts it off in 14 seconds, and smaller sizes in proportion. This speed can be duplicated day after day.

The "TOLEDO" No. 999 is made strong and sturdy, yet compact and strictly portable. The ideal ½" to 2" pipe machine on the market today.

A postcard brings complete information.

**THE TOLEDO PIPE THREADING MACHINE CO.** **TOLEDO, OHIO**

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C-F
—or around, in, leading to, or from *all* natural gas handling operations — there's a C-F Regulator which will do everything you can expect—and do it better. The oldest manufacturer of gas regulators has something more than ordinary service to offer in its complete line of products.
*What job do you want regulated? There's a C-F that will be most satisfactory.*

# VALVES
# PIPE FITTINGS
# FIRE HYDRANTS

# KENNEDY

EVERY part of each Kennedy Valve type for oil industry service is designed with an exceptionally high margin of strength and rigidity. You will find the bodies, bonnets, flanges, and stuffing boxes of particularly generous proportions, the hand wheels and stems sturdy and strong, and the operating mechanisms simple, effective and durable.

The thousands of Kennedy installations in every oil industry service have definitely established an excellence of design and construction that enable Kennedy Valves to give efficient, trouble-free service over a long period of years.

The extensive Kennedy line includes 400-lb., 700-lb., 1000-lb., 1600-lb., and 2500-lb. test gate valves, as well as many other types of gate, globe, angle and check valves for a wide range of service, together with standard types and sizes of malleable iron screwed fittings and cast iron flanged fittings.

Write for the Kennedy catalogue describing and listing all the Kennedy products.

**THE KENNEDY VALVE MFG. CO., ELMIRA, N.Y.**

WAREHOUSES: New York, 128-132 White St.; Chicago, 1335-1337 So. Clinton St.; San Francisco, 448-450 Tenth St.
SALES OFFICES: New York, Philadelphia, Cleveland, Chicago, Atlanta, Salt Lake City, El Paso, Los Angeles, San Francisco, Seattle.



# AMCO ALL-WEATHER ROPE

is the answer to the long felt need in the oil country for Manila cordage that will *resist dry-rot*. Most every field man is aware of the deteriorating effect of age, improper storage, exposure to the elements, etc., to fibre rope with the resultant danger to life, damage to equipment, loss of time, etc.

It took years of experimental work on the part of the laboratory of our parent concern, the American Manufacturing Company of Brooklyn, New York, to develop just the fibre treatment desired. They attained all they were striving for,—a treatment that not only preserves the fibre and protects its strength against serious damage, but which also remains on the hemp permanently. The patented treatment does not contain coal or pine tar, graphite, etc., and does not make the rope smeary.

Each minute fibre in "AMCO" "ALL-WEATHER" Rope receives its proper share of the treatment since all the fibres are processed prior to spinning into yarn. Some "treated ropes" that have come to our attention, and which are perhaps offered as "substitutes" for "AMCO", appear to get their treatment by running the yarns through a bath. This often has a tendency to "load" the rope, i.e. put on more than the necessary amount and consequently, in order to keep the weight of the rope in line, it is necessary to reduce the actual fibre content.

Remember "AMCO" "ALL-WEATHER" Manila is guaranteed to weigh no more than and to contain just as much fibre as the untreated cordage. The next time you need a bull rope or cat line insist on "AMCO" "ALL-WEATHER" Rope, made as nearly ROT-and-WATER-PROOF as rope can be made. If the experience of others is any criterion then you, too, will admit it is the super-cordage.

## St. Louis Cordage Mills

Eleventh & Soulard Sts., St. Louis, Mo.

*Branch of*

AMERICAN MANUFACTURING COMPANY
Noble & West Sts., Brooklyn, N. Y.

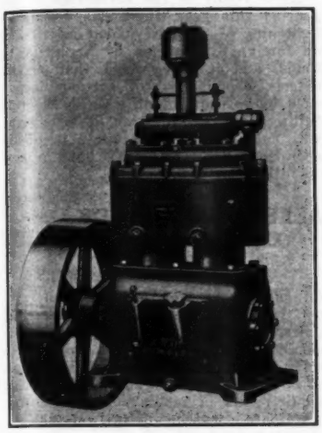
The GREEN marker yarn on the outside of one strand of the dark brown rope identifies "AMCO" "ALL-WEATHER" Manila.

*COSTS SLIGHTLY MORE BUT IT'S WORTH IT*

# Oil Industry Equipment and Supplies

## CURTIS ANNOUNCES NEW LINE OF COMPRESSORS

The Curtis Pneumatic Machinery Co., St. Louis, Mo., has developed a new line of industrial compressors, known as Curtis model C Timken-bearing compressors, which it is ready to place on the market. The line consists of seven models,



five of the two-cylinder type, ranging in size from 4¼x3¾ to 6½x5, with a displacement of 25 to 125 cubic feet and two of the four-cylinder type, a 5½x5¼ and 6½x5¼ size, with a displacement of 115 to 262 cubic feet.

The model C compressors are furnished not only as stationary simple compressors for belt drive from a line shaft, separator motor, steam engine or other prime mover, but also as complete self-contained units, either direct connected or driven by multiple V belt. They also are supplied with support wings instead of base mounting, when incorporated in portable units.

Outstanding among the features of the model C compressors are the carbon-free valves, the use of Timken bearings on the crankshaft and the Curtis "Centro-ring" oiling method.

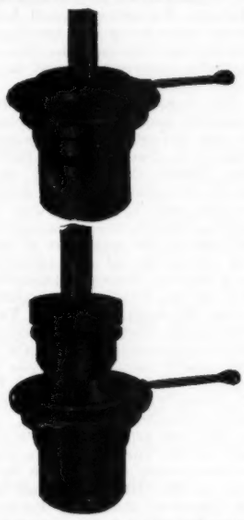
Valves are of the light disc type, double heat treated and made of rust-resisting metal. The small individual non warping valves have single large nonobstructed ports and are carbon free. The head design made possible the carbon-free feature. This is accomplished by delivering air into the cylinder at the lowest possible temperature and maintaining the piston and cylinder walls at a minimum temperature. This low air temperature is assured by having large diameter, short intake passages, large ports and straight line air flow. Carbon formation on the valves is further overcome in this construction because neither the crankshaft, counterweights nor connecting rods ever touch the bath of oil. As a result the oil in the crankcase is not beaten up into a foam or froth and cannot flood the cylinders.

The main bearings are Timken roller bearings, so mounted as to preserve the rigidity of the shaft and to take care of any thrust loads that may arise during operation.

In the "Centro-ring" oiling method a large diameter ring operating at slow peripheral speed carries oil to the crankshaft midway between the bearings, from where it is delivered by centrifugal force through large oil ducts to each throw, thereby oiling connecting rod bearings under constant pressure feed. The large steel ring is the only moving part of this system. As long as there is oil in the crankcase, the compressor will lubricate.

## BLOWOUT PREVENTER IS DESIGNED FOR HARD USE

The MacClatchie Manufacturing Co., Compton, Calif., has introduced a rotating blowout preventer which the company says will withstand any pressure encountered in present-day drilling and stand up under hard usage. It is designed so that there is no wear on the packing unless under pressure at which time it is practically friction proof from the packing. The packing packs off automatically, thereby eliminating the necessity of tightening packing glands.



The preventer is latched or unlatched by a rope running up to the derrick floor, thus making it fast and easy to operate and eliminating the necessity of the crew going into the cellar to latch or pack it off. The interior of the swivel is equipped with large rollers to take the side thrust and rotates on two large rows of ball bearings, enabling it to carry the weight and to operate under pressure. All parts are heat-treated, hardened or ground and the complete assemblies are tested to 4,000 pounds cold water pressure before being shipped from the factory. The preventer is made for all sizes of casings and kellies.

## PRESSURE CONTROLLER UNUSUALLY SENSTIVE

The Fisher Governor Co., Marshalltown, Iowa, has put on the market its Series 4,000 pressure controller to control reduced pressure, relief or back pressures and for boiler pressure control by regulating the gas or oil fuel supply. The Series 4,000 is an exceptionally sensitive pressure controller of the pilot actuated and auxiliary operated type. It gives accurate and positive control of reduced pressures, relief pressures, or vacua. It is also suited for service as a boiler gas or oil fuel governor, and in this capacity is said to function successfully with the highest of boiler pressures.

This controller is used for pressure reducing service where it is necessary to hold the reduced pressure within extremely close limits and still have a widely varying load demand on the low pressure service. When used as a relief valve this device gives close control of the relief pressure. In boiler gas or oil fuel governor service the condition frequently exists where the boiler is supplying steam to a load which has a very unsteady and variable demand, and the governor must be capable of quickly adjusting the flow of gas or oil to the burners to correct for any fluctuations in boiler pressure. For such service the Series 4,000 is said to be entirely satisfactory, holding the boiler pressure steady, with variations in boiler pressure so small as to be scarcely noticeable.

This controller develops ample power to operate the main valve, and when supplied with the recommended construction for such service it will handle viscous or corrosive fluids. Application of the auxiliary operating medium to secure the movement of the main valve is controlled by a smooth-acting control unit.

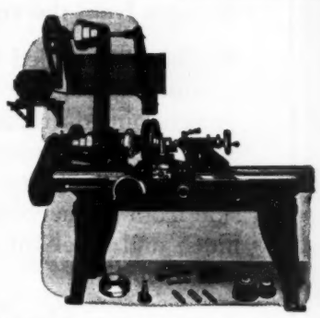
### VOLZ FEED-WATER REGULATOR

Arrangements have been made by the J. A. Campbell Co. of Long Beach, Calif., to manufacture and sell the new Volz feed-water regulator. G. W. Volz, engineer, for the past 10 years has been identified with the development of apparatus for steam plants. His most recent development is an improved type of boiler feed-water regulator, manufacture of which will begin immediately by Campbell.

## GENERAL-PURPOSE LATHE OFFERED BY SOUTH BEND

A general-purpose lathe designed for general machine shop and maintenance shop work has been added to its junior line by the South Bend Lathe Works, South Bend, Ind.

This new lathe, called the Sixteen Inch



Junior, has a 16-inch swing, which permits the handling of large diameter work. As it is available in bed lengths of 6 to 12 feet, this equipment unit will also handle work of unusual length. There has been a simplification in construction and design and the lathe has been relieved of nonessential, expensive features not needed in general machine shop work. It is a back-geared, screw-cutting lathe with automatic longitudinal feed and eight changes of spindle speed. All standard screw threads may be cut, from 2 to 40 per inch, right or left hand, including 11½ pipe thread. The headstock spindle is made of special carbon steel, finish ground, with a 1⅜-inch hole through its entire length.

Bearings are of phosphor bronze and adjustable for wear. The tailstock has a setover for taper turning, graduated spindle, improved binding plugs and hardened center. The compound rest will swivel to any angle and has an angular travel of 3¾ inches. Particulars and mechanical description are given in the new general catalog No. 92, issued by the South Bend Lathe Works.

## DEVICE GIVES COMPLETE WIRING AND MOTOR DATA

Designed to compute complete wiring and motor data, the Square D calculator is offered by the affiliated Diamond E-Square D organization. It has been aptly characterized as the slide rule of the electrical industry. It is a handy, compact unit containing two separate and distinct calculators, one computing wiring, the other computing motor data. Its figures are distinct and legible and are protected by a waterproof celluloid covering. The calculator fits conveniently into the pocket. Because of its substantial construction it may be used as effectively in the field as in the office.

The wiring calculator, computing all interior and conduit wiring problems will figure any one of four items—amperes, feet of wire, size of wire, percentage drop. From the motor calculator dial can be obtained the size of circuit switch, size of starting fuse, size of conduit, size of wire, running protection necessary and full load amperes on any of the three principal types of 220 or 440 volt, 3-phase motors.

The Square D calculator does away with mental or written calculations and eye strain as well as trouble in locating charts and determining whether they have become obsolete. The device is made by the Diamond Electrical Manufacturing Co., 1320 East Sixteenth Street, Los Angeles, Calif.

## TWO "CATERPILLARS" DESIGNED FOR OIL FIELD WORK

The Sixty tractor, made by the Caterpillar Tractor Co., Peoria, Ill., is equipped to meet the extreme conditions often encountered in oil field work and the laying of pipe lines. It is designed to facilitate the mounting of winches, booms and other such items. The equipment includes 20-inch heat-treated grouser shoes, scavenge oil pump, crank case guard, front pull hook, front bumper, radiator guard and engine closure hood.

The Thirty is made to meet the peculiarly severe requirements of pipe line and oil field work. It is wide-gauge for stability with booms and for steep hill work. It has extra track surface and extra wear resistance to meet extreme conditions. Winches, booms and other equipment are easily mounted. Equipment includes 16-inch heat-treated tracks, engine enclosure hood, crank case guard and front pull hook.

The illustration shows two Caterpillar Sixties hauling an 87,000-pound tank used in connection with repressuring operations on Humble Oil & Refining Co. property in Texas.

# - - Drill with ASSURANCE -

Prevailing prices of crude prohibit needless waste in drilling costs. Yet such costs can mount amazingly when the driller deviates from the vertical.

We have provided the oil man with a common-sense, safe and sure method for ascertaining the direction of his bore hole. The SYFO Clinograph establishes beyond the possibility of doubt any diversion from the perpendicular. It tells how much and it tells it *on paper*—a permanent record.

Accurate, quick and inexpensive, the SYFO Clinograph furnishes daily records of deviation in drilling—obtained *without the use of dangerous acids.* You can use the SYFO on wire line running through drill stem, on sand or bailing line in open hole or by the "Go-Devil" method.

Write for complete literature, also for information on the SURWEL Gyroscopic Clinograph.

**Sperry-Sun Well Surveying Co.**
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Houston, Texas:
1417 Esperson Building

Los Angeles, Calif.:
415 Petroleum Securities Bldg.

Calgary, Alberta, Can.:
Room 1, Central Block

SYFO
CLINOGRAPH


# ARGENTINE REPUBLIC EXPANDS ITS REFINING CAPACITY IN 1931

Argentina, formerly an important market for refined products from the United States, has definitely joined the ranks of nations committed to a policy of domestic refining expansion, and there are indications that further additions to the refining facilities of that country will be made.

At last reports there were 16 refineries in Argentina, with aggregate daily crude capacity of approximately 56,750 bbls. La Plate is the principal refining center, with eight refineries with aggregate daily throughput of 40,000 bbls. Comodoro Rivadavia, the chief crude producing area of Argentina, ranks second in point of importance as a refinery center, having three refineries, with joint capacity for handling 11,500 bbls. of crude per day. Two refineries are located at Bahia Blanca, and one each at Plaza Huincul, Embarcacion, and Lomitas, all of the latter being very small units catering to local consumption. One new plant is under construction, and is scheduled for completion during 1932.

The Argentine demand for liquid fuel products, according to a recent report to the Department of Commerce from Charles H. Ducote, United States Assistant Trade Commissioner at Buenos Aires, is supplied both by domestic production and by importation from the various foreign producing countries. Lubricants, in the main, are of foreign origin, but crude oil and products are of both classes. Domestic production occupies seven principal organizations, of which the most important, Yacimientos Petroliferos Fiscales, is operated by the federal government. There are also several smaller companies. Wells are being exploited in three regions, Comodoro Rivadavia, Plaza Huincul and Salta. The total domestic production of petroleum in 1930 was reported as 8,909,772 bbls.; that for the current year is expected to be considerably larger. More than 80 per cent of the 1930 production was from the Comodoro Rivadavia Field. Yacimientos Petroliferos Fiscales produced a total of 5,201,830 bbls. in the three fields, or 58.5 per cent of the total.

Not all of the domestic output is used within the country, the official statistics showing that small quantities of fuel oil were exported.

### Increased Crude Imports

The growing importance of petroleum refining operations in Argentina has been reflected in the increasing incoming shipments of crude oil for refining. The bulk of crude imports each year came from Peru, the next largest amounts from Colombia, and smaller quantities from the United States and Mexico.

The new refinery now under construction, which will be thoroughly modern with daily throughput of 10,000 bbls., will be operated by the distributors of the products of an American oil company, and it is expected that when the plant is in operation it will draw large stocks of crude either from the Gulf or Venezuela.

All of the important refineries now operating in Argentina, and the one under construction, are equipped to do both topping and cracking. Consumption of gasoline has been constantly on the increase during the past several years, and, in consequence, both imports and domestic production have advanced steadily. During 1930 total gasoline consumption in Argentina was estimated at 5,200,000 bbls., and it is expected that the corresponding figure for the present year will be much larger.

### Kerosene Declining

The year-to-year demand for kerosene has shown a declining tendency, if any, and it appears likely that in the future its value for heating and lighting will be lessened owing to a greater use of other classes of heating apparatus and the spread of electricity. As a source of motive power, kerosene already has been displaced largely by gasoline and the heavier fuels, such as fuel and gas oils.

Imports of lubricants, both oils and greases, have mainly been of American origin, and, although the American share of the business has declined during the past three years, firms in the United States supplied about 75 per cent of the total last year.

There is rather keen competition among the firms distributing lubricating oils in Argentina. Domestic production is reported as fairly important, one foreign-owned company producing, it has been roughly estimated, 25 per cent of the lubricating oils consumed within the country. One other private company and the Y.P.F. (government company) produce minor quantities.

As a result of the revolution in Argentina this year, there has been some lightening of the government restrictions on foreign exploitation of Argentine oil fields, and it is expected that private enterprise will be still further encouraged by government officials in the near future. This liberalization, it is believed, will not only embrace crude producing operations in Argentina, but refinery operations as well.

# SEES LESSENING OF COAL-OIL COMPETITION

(Continued from Page 71)

nite and fixed proportion of each product. If straight distillation had remained the sole means of refining petroleum, it would be essential today to produce two or three times as much crude petroleum as is now required to supply the world's requirements of motor spirit. Moreover, inordinate quantities of fuel oil—the residue of straight distillation—would have been produced and would have glutted all markets with redundant supplies.

The advent and the rapid development of the petrol engine stimulated the oil industry both to new invention and to the development of well-known, but little-used processes. Among these the most important is that to which the term "cracking" is applied.

### Versatility of Petroleum

In the year 1865, James Young, Jr., the son of the founder of the Scottish shale industry, patented a process for the cracking of gas oil into burning oil. That patent and later technical improvements have enabled us to prevent an otherwise unavoidable waste of great quantities of crude petroleum. It is possible to subject fuel oil to heat and pressure in such a manner that heavy molecules are broken up or "cracked" into the lighter molecules which are the characteristic constituents of motor spirit.

In 1909, little more than 10 per cent of an average crude oil was converted into motor spirit. By 1914, the proportion had risen to over 18 per cent, and, at the present time, approximately 42 per cent of the crude produced in the United States is ultimately converted into, and used as motor fuel. That development has resulted from a variety of causes. Owing to improvements in carburation a wider "petrol fraction" is utilized as motor spirit; the process of straight distillation had advanced technically; and cracking in alliance with light spirit derived from natural gas, has done the rest.

The versatility of petroleum is perhaps sufficiently illustrated by the foregoing remarks. They relate, of course, solely to the past; but it is comforting to realize that the future holds promise of an even greater measure of adaptability. The developments which are now being made in respect to hydrogenation are well known. The process of hydrogenation is based on the fact that the light hydrocarbons which constitute the most volatile constituent of petroleum, i.e., petrol, have a larger ratio of hydrogen to carbon in the molecule than exists in the heavy molecules of the fuel residue. The addition of hydrogen atoms under pressure to these heavy fuel molecules, conjoined also with a process of cracking, results in the formation of light molecules corresponding to the constitu-

ents of petrol. The cracking process already mentioned involves the production also of gas and coke residues, only a proportion of the fuel being convertible into petrol; hydrogenation, however, is technically capable of converting the whole of a quantity of fuel oil into the lighter product.

In principle, the hydrogenation of coal does not differ materially from that of oil; and the obstacles in the way of the synthetic production of oil from coal fall more in spheres other than those of science. There appears little doubt, however, that in hydrogenation, primarily of oil, eventually of coal, and in the wide range of other technical developments which have added so greatly to the adaptability of petroleum, the value of the world's ultimate fuel resources has been much enhanced.

### Coal and Oil

Stress is too often laid upon the competition that exists between coal and oil as sources of energy. In this country, for instance, annual production of coal exceeds 240,000,000 tons and annual importation of oil amounts to 7,000,000 or 8,000,000 tons. Home consumption of the two fuels is respectively 170,000 000 tons and, say, 6,500,000 to 7,000,000 tons. Motor spirit and Diesel oil—as Mr. Tizard will confirm—act as stimulants to the consumption of coal. We import annually some 3,000,000 tons of the former product. Kerosene, of which consumption amounts to 700,000 tons, is employed largely for domestic lighting and heating in regions where no other illuminant is available. It serves also as the motive power of farm tractors and of fishing boats—uses in which it has replaced, not coal, but horses and the force of wind. As to lubricants, of which we consume over 400,000 tons a year, it can truly be said that they are vital to the consumption of coal; without lubricating oils and greases, modern machinery would be brought immediately to a standstill.

The figure of 6,500,000 to 7,000,000 tons which I have given as our home consumption of petroleum includes 1,000,000 tons of fuel oil used as ships' bunkers and a further 1,000,000 tons consumed within the country for industrial and domestic purposes. In respect to those uses oil competes directly with coal. It may be of interest to examine the circumstances and implications of that competition.

### Relative Cost of Production

The average cost of producing 1 ton of flowing crude oil and bringing it to the surface of the earth may be estimated at one-quarter of the expense entailed in mining and raising a ton of coal. That ratio will probably subsist for a number of years.

At the well head and the pit head, coal and oil are, virtually, the raw materials of fuel. Coal, it is true, needs little preparation for the market; but, as Sir David Milne Watson has said, the tendency among consumers is to require more careful grading and cleansing. Oil, on the other hand, needs a complete range of treatment before it is available as a fuel. Moreover, by reason of the location of oil deposits in areas which are often distant from centers of consumption, the element of transport—and its cost—often bulks somewhat largely in the price paid by the consumer. Ultimately, therefore, petroleum products are more costly, for equal weights, than coal; and since their value in terms of heat is greater, a higher price has economic justification.

The foregoing considerations apply with particular force to fuel oil used for raising steam under boilers. In that utilization, as I have said, oil competes directly with coal. Hitherto that competition has been most severe in respect to ships; and it is probable that developments and improvements in the maritime Diesel engine will cause a still wider extension of the use of oil at sea. On land, however, and particularly in Great Britain, the use of oil for power and heating purposes is more severely limited. In this country coal is cheap and plentiful and its energy is available either in the form of the solid fuel or in that of gas and electricity. Oil, therefore, has made little headway. The annual internal use in Great Britain of 1,000,000 tons of fuel oil is insignificant in comparison with a consumption of coal amounting to 170,000,000 tons. Moreover, that oil is chiefly used for special purposes to which coal is unsuited; and it is improbable that its consumption will greatly expand.

### Bunker Oil

A special word, however, is needed in respect to bunkers. It is part of our national fuel problem that certain types of ships in the British mercantile marine and almost all important types of naval ships, are dependent on oil fuel.

As regards the mercantile marine, the use of oil is dictated by reasons of a severely economic nature — the special character of employment, and the power/cost ratio of oil to coal at the various ports at which ships normally bunker being the determining factors.

The many technical advantages of oil for naval purposes have been frequently emphasized by experts, but it seems to me that sufficient stress has not been laid on the greater flexibility of supply obtained from the use of oil fuel. The navy is a ubiquitos service under both peace and war conditions, and must, therefore, be equipped accordingly. Twenty years ago, it was virtually restricted to special types of semianthracite coal derived from one single source of supply and susceptible to marked deterioration if kept for long periods in storage, particularly in tropical countries. Oil on the other hand is available from many sources throughout the world; it can be stored for very long periods without measurable deterioration; its thermal efficiency is much higher, and its transport handling and ultimate combustion are effected with a minimum toll on human effort. Finally, it is to be remembered that the navy can now get its oil fuel supplies at many bases in the seven seas at a rate per ton which is actually less than that at which Welsh coal could possibly be supplied.

### Market on Thermal Units

For industrial purposes, however, I am convinced that the future holds out prospects of a gradual diminution in whatever competitive activities may now exist between coal and oil. Coal has been distributed by nature in many countries throughout the world. Oil is found, sometimes in regions which possess reserves of coal, sometimes in those which are otherwise unendowed with fuel. A time will come—and it may not be very distant—when coal and oil will be marketed upon a basis of utilizable thermal units, with reference to the geographical location of deposits in relation to center of consumption. They will be consumed in manners which will extract the maximum thermal efficiency from each. At a given place and at a given time, the use of coal will be more economical than that of oil. Conversely, circumstances elsewhere or at other times, will operate in favor of the liquid fuel. For myself, I look forward in the future to an ever increasing measure of harmony and coordinated action in respect to the consumption of coal and oil; and I shall acclaim with whole-hearted sincerity any developments which enable the world to extract full measure of value, in terms of efficiency or of service, from the great reserves of potential energy with which nature has endowed us.

## UNIVERSITY ROYALTY SUIT

AUSTIN, Tex., Dec. 28.—J. V. Allred, attorney general, has filed suit in the district court, on behalf of the permanent fund of the University of Texas, seeking to recover amounts alleged to be due on oil royalties totaling $575,000. The petition seeks recovery from Texon Oil & Land Co., Group Number One Oil Corp., Group Number Two Oil Corp., Reagan County Purchasing Co. and Humble Oil & Refining Co. in the sum of $225,000, and from Big Lake Oil Co., Reagan County Purchasing Co. and Humble in the sum of $350,000. Texon Oil & Land Co. is controlled by Continental Oil Co.


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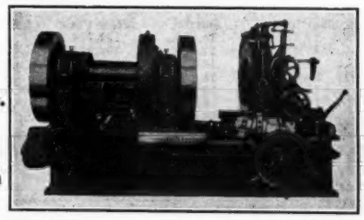

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Read the Classified Bargains on pages 84 and 85 of this week's issue.

# Oklahoma-Kansas and Eastern Pipe Line Report

### OKLAHOMA-KANSAS
### Pipe Line Statement for October

**Runs**

| | Month (bbls.) | Dy.av. (bbls.) |
|---|---|---|
| Prairie P. L. Co.* | 713,000 | 23,000 |
| Gulf P. L. Co. | 1,470,856 | 47,447 |
| Texas P. L. Co. | 583,619 | 18,988 |
| Magnolia P. L. Co. | 1,383,175 | 44,618 |
| Empire P. L. Co. | 2,221,054 | 71,647 |
| Cosden P. L. Co. | 618,223 | 19,946 |
| Stanolind P. L. Co.* | 2,790,000 | 90,000 |
| Oklahoma P. L. Co. | 2,194,600 | 70,794 |
| Other lines | 4,154,000 | 134,000 |
| Total October | 16,133,640 | 520,440 |
| Total September | 11,369,689 | 378,990 |
| Difference | 4,763,951 | 141,450 |

**Shipments**

| | | |
|---|---|---|
| Prairie P. L. Co. | 3,045,351 | 98,237 |
| Gulf P. L. Co. | 1,716,665 | 55,376 |
| Texas P. L. Co. | 846,356 | 27,302 |
| Magnolia P. L. Co. | 1,269,347 | 40,947 |
| Empire P. L. Co. | 2,271,402 | 73,271 |
| Cosden P. L. Co. | 721,801 | 23,284 |
| Stanolind P. L. Co. | 3,632,022 | 117,162 |
| Oklahoma P. L. Co. | 1,940,386 | 62,609 |
| Other lines* | 4,557,000 | 147,000 |
| Total October | 20,000,328 | 645,188 |
| Total September | 20,069,659 | 669,654 |
| Difference | 68,831 | 24,466 |

**Stocks**

| | |
|---|---|
| Prairie O. & G. Co.* | 35,816,000 |
| Gulf P. L. and Gypsy Oil Co. | 7,669,159 |
| The Texas Company | 3,720,270 |
| Magnolia Petroleum Co. | 7,049,502 |
| Empire P. L. Co. | 3,441,230 |
| Mid-Continent Petroleum Corp. | 3,296,916 |
| Stanolind Crude Oil Pur. Co.* | 15,170,000 |
| Oklahoma P. L. Co. | 1,280,706 |
| Carter Oil Co. | 6,825,688 |
| Other lines* | 14,911,500 |
| Total October | 99,180,971 |
| Total September | 98,657,494 |
| Difference | 477,400 |

*Estimated. Shipments include a considerable quantity of Texas crude oil.

### EASTERN PIPE LINE REPORT FOR MONTH OF NOVEMBER

**Runs from Wells**

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky, Illinois, Indiana and Michigan for October and November:

| | Oct., 1931 | Nov., 1931 |
|---|---|---|
| Nat. Transit | 154,511.51 | 124,750.97 |
| S W Pa. P. L. | 79,162.91 | 74,098.69 |
| Eureka P. L. | 321,800.33 | 283,984.98 |
| Buckeye P. L. (Macksburg) | 382,641.33 | 357,058.99 |
| Buckeye P. L. (Cleveland) | 12,576.07 | 12,136.62 |
| Buckeye P. L. (Lima, etc.) | 85,128.77 | 66,302.98 |
| Indiana P. L. | 2,549.84 | 2,333.35 |
| N. Y. Transit | 36,518.13 | 37,877.10 |
| Tide Water P. L. | 33,220.70 | 33,526.84 |
| Pure Oil | 313,618.79 | 294,109.73 |
| Stoll Oil Ref. | 69,655.93 | 77,377.78 |
| Bradford Tran. | 476,204.68 | 396,444.31 |
| Ashland Ref. | 144,386.55 | 144,095.48 |
| Total | 2,002,475.44 | 1,794,597.72 |
| Daily average | 64,595.98 | 59,819.93 |

**Petroleum Deliveries**

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for October and November:

| | Oct., 1931 | Nov., 1931 |
|---|---|---|
| Nat. Transit | 582,367.42 | 555,055.73 |
| S W Pa. P. L. | 479,782.62 | 353,585.86 |
| Eureka P. L. | 354,253.27 | 270,980.17 |
| Buckeye P. L. (Macksburg) | 284,152.11 | 228,830.83 |
| Buckeye P. L. (Cleveland) | 1,712.38 | 1,715.98 |
| Buckeye P. L. (Lima, etc.) | 1,712,258.64 | 1,703,435.58 |
| Indiana P. L. | 856,217.10 | 754,554.80 |
| Southern P. L. | 69,625.59 | 70,467.39 |
| N. Y. Transit | 191,559.63 | 192,298.27 |
| Northern P. L. | 168,179.98 | 151,356.81 |
| Tide Water P. L. | 516,207.68 | 424,477.09 |
| Pure Oil | 268,733.25 | 394,500.51 |
| Bradford Tran. | 559,039.81 | 413,554.01 |
| Tuscarora | 346,805.63 | 266,328.33 |
| Ashland Ref. | 144,386.55 | 112,625.93 |
| Total | 6,535,782.71 | 5,892,757.31 |
| Daily average | 210,831.70 | 196,425.24 |

**Gross Stocks**

The gross stocks held by various pipe lines in the oil-producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky at the close of October and November:

| | Oct., 1931 | Nov., 1931 |
|---|---|---|
| Nat. Transit | 673,029.13 | 695,594.17 |
| S W Pa. P. L. | 435,631.21 | 415,253.99 |
| Eureka P. L. | 1,162,617.18 | 1,207,012.46 |
| Buckeye P. L. (Macksburg) | 307,630.86 | 284,226.29 |
| Buckeye P. L. (Cleveland) | 36,248.91 | 46,414.61 |
| Buckeye P. L. (Lima, etc.) | 2,659,895.96 | 2,616,930.98 |
| Indiana P. L. | 551,521.77 | 541,296.24 |
| Cumberland P. L. | 64,611.76 | 64,408.44 |
| Southern P. L. | 233,968.56 | 183,750.86 |
| N. Y. Transit | 99,292.01 | 111,520.13 |
| Northern P. L. | 300,534.94 | 328,199.83 |
| Tide Water P. L. | 1,015,782.92 | 941,847.74 |
| Pure Oil | 556,871.54 | 481,451.24 |
| Tuscarora | 11,658.70 | 11,135.16 |
| Bradford Trans. | 308,399.51 | 328,694.79 |
| Ashland Ref. | | 552,649.50 |
| Total | 8,417,694.91 | 8,830,386.37 |
| Decrease | 74,736.52 | |
| Increase | | 412,691.46 |

**Grades of Oil**

The following table shows the amount of the different grades of oil held by the eastern pipe lines at the close of October and November, showing gross stocks of the above fields:

| | Oct., 1931 | Nov., 1931 |
|---|---|---|
| Pennsylvania | 3,031,430.00 | 2,961,620.08 |
| Lima | 619,693.95 | 602,227.53 |
| Kentucky | 75,019.27 | 627,465.45 |
| Mid-Continent | 4,145,615.17 | 4,143,909.75 |
| Illinois | | 23,229.59 |
| Michigan | 546,936.52 | 471,933.98 |
| Total | 8,417,694.91 | 8,830,386.37 |

**Daily Average Runs**

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

| | 1928 | 1929 | 1930 | 1931 |
|---|---|---|---|---|
| Jan. | 52,904 | 51,749 | 75,907 | 53,939 |
| Feb. | 57,002 | 51,833 | 79,256 | 55,163 |
| Mar. | 57,485 | 54,252 | 76,688 | 54,331 |
| April | 56,812 | 58,444 | 84,536 | 54,914 |
| May | 62,067 | 59,902 | 70,546 | 53,344 |
| June | 58,230 | 58,833 | 76,430 | 54,110 |
| July | 57,144 | 66,087 | 68,921 | 50,723 |
| Aug. | 57,745 | 66,087 | 64,291 | 51,502 |
| Sept. | 53,487 | 67,316 | 56,595 | 51,345 |
| Oct. | 58,100 | 76,093 | 58,179 | 64,595 |
| Nov. | 53,865 | 74,831 | 52,332 | 59,810 |
| Dec. | 52,025 | 74,561 | 53,999 | |

**Daily Average Shipments**

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

| | 1928 | 1929 | 1930 | 1931 |
|---|---|---|---|---|
| Jan. | 146,465 | 165,721 | 217,623 | 175,369 |
| Feb. | 167,368 | 159,387 | 224,355 | 183,494 |
| Mar. | 158,582 | 161,474 | 228,846 | 189,506 |
| April | 172,935 | 169,737 | 241,845 | 191,450 |
| May | 180,559 | 184,281 | 248,383 | 199,247 |
| June | 188,024 | 185,404 | 234,401 | 221,155 |
| July | 189,470 | 194,763 | 207,094 | 211,632 |
| Aug. | 192,853 | 194,946 | 205,506 | 224,166 |
| Sept. | 194,138 | 201,214 | 193,999 | 217,537 |
| Oct. | 176,000 | 191,367 | 157,675 | 210,331 |
| Nov. | 176,898 | 203,742 | 146,626 | 196,431 |
| Dec. | 173,572 | 184,257 | 143,001 | |

**Gross Stocks**

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

| | 1929 | 1930 | 1931 |
|---|---|---|---|
| Jan. | 7,596,564 | 12,220,045 | 11,831,092 |
| Feb. | 8,738,835 | 12,991,561 | 11,506,489 |
| Mar. | 9,902,058 | 13,247,317 | 11,012,162 |
| April | 8,978,172 | 13,233,961 | 11,044,487 |
| May | 8,902,560 | 13,052,953 | 10,728,239 |
| June | 8,921,275 | 13,396,855 | 9,903,349 |
| July | 9,211,565 | 13,268,562 | 9,569,849 |
| Aug. | 9,440,643 | 13,047,051 | 9,192,457 |
| Sept. | 9,443,067 | 12,812,018 | 8,492,431 |
| Oct. | 9,441,101 | 12,437,553 | 8,417,694 |
| Nov. | 9,868,538 | 11,861,380 | 8,830,386 |
| Dec. | 11,253,953 | 11,761,952 | |

**The Illinois Field**

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

| | Bbls. |
|---|---|
| Gross stocks, Dec. 1 | 429,304.17 |
| Runs from wells | 446,775.79 |
| Regular deliveries | 281,258.45 |
| Other deliveries | 190,386.60 |

The amount of Illinois oil run by the Tide Water Pipe Co. in November was 23,526.84 bbls. Deliveries were none. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

| 1931— | Runs | Deliveries |
|---|---|---|
| November | 470,302.63 | 281,258.45 |
| 1930— | | |
| January | 543,387.95 | 498,293.91 |
| February | 543,416.33 | 414,536.59 |
| March | 631,944.49 | 469,119.53 |
| April | 530,074.22 | 509,304.60 |
| May | 605,147.37 | 504,069.84 |
| June | 572,562.57 | 468,658.81 |
| July | 604,529.54 | 388,454.47 |
| August | 594,642.12 | 375,742.43 |
| September | 457,001.11 | 371,691.61 |
| October | 475,442.12 | 320,688.71 |
| November | 422,794.68 | 355,402.12 |
| December | 556,418.78 | 363,719.55 |
| 1931— | | |
| January | 468,429.04 | 469,573.19 |
| February | 439,284.54 | 461,262.35 |
| March | 424,638.22 | 356,663.24 |
| April | 421,814.98 | 282,532.65 |
| May | 433,231.80 | 322,513.36 |
| June | 510,805.78 | 320,258.12 |
| July | 530,009.38 | 289,219.05 |
| August | 476,823.56 | 393,231.06 |
| September | 492,183.83 | 323,012.50 |
| October | 495,124.13 | 325,834.95 |

Tide Water Pipe Co., Ltd., also delivered in November, 88,089.55 bbls. Oklahoma oil.

## AVERAGE DAILY IMPORTS OF CRUDE AND REFINED OIL AT PRINCIPAL UNITED STATES PORTS

| Average barrels per day in 1930-31— | ATLANTIC PORTS: Baltimore | Boston | New York | Philadelphia | Others | Total | GULF COAST PORTS: Galveston | New Orleans, Baton Rouge | Port Arthur, Sabine Pass | Tampa | Total | Total all ports |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| December | 21,419 | 14,033 | 122,774 | 32,339 | 33,774 | 224,339 | 6,290 | 10,613 | 2,097 | 290 | 19,290 | 244,129 |
| January | 17,613 | 13,519 | 154,225 | 33,903 | 30,613 | 248,871 | 2,032 | 11,677 | 2,097 | 3,097 | 18,903 | 267,774 |
| February | 31,321 | 16,929 | 127,786 | 31,714 | 26,857 | 234,607 | 4,536 | 11,571 | .... | 536 | 16,642 | 251,250 |
| March | 27,645 | 13,925 | 141,169 | 26,290 | 21,129 | 230,161 | 4,065 | 2,580 | .... | 1,968 | 8,613 | 246,774 |
| April | 35,000 | 10,533 | 105,000 | 29,767 | 35,533 | 215,833 | 2,733 | 3,400 | .... | .... | 6,133 | 221,966 |
| May | 30,129 | 8,774 | 107,000 | 25,452 | 26,710 | 198,065 | .... | 2,000 | .... | .... | 2,000 | 200,065 |
| June | 30,067 | 10,833 | 111,767 | 27,000 | 20,833 | 200,500 | 2,300 | 5,500 | 2,167 | 1,333 | 12,300 | 212,800 |
| July | 26,387 | 11,226 | 104,678 | 29,323 | 21,773 | 193,387 | 6,903 | 7,419 | 4,194 | .... | 18,516 | 211,903 |
| August | 32,613 | 15,581 | 91,742 | 22,387 | 26,741 | 188,064 | 4,161 | 2,516 | .... | 3,162 | 9,839 | 197,903 |
| September | 27,067 | 7,267 | 106,867 | 20,099 | 22,967 | 184,267 | 4,833 | 8,333 | .... | .... | 13,166 | 197,433 |
| October | 53,710 | 14,484 | 100,774 | 26,742 | 40,645 | 236,358 | 6,097 | 6,871 | 2,097 | 1,833 | 16,903 | 253,258 |
| November | 48,033 | 28,800 | 51,667 | 28,600 | 12,967 | 170,067 | 3,933 | 10,833 | 3,033 | 1,367 | 19,166 | 189,233 |

## AVERAGE DAILY RECEIPTS OF CALIFORNIA CRUDE AND REFINED OIL AT ATLANTIC AND GULF PORTS

| Average barrels per day in 1930-31— | ATLANTIC PORTS: Baltimore | Boston | New York | Philadelphia | Others | Total | GULF COAST PORTS: Galveston | New Orleans, Baton Rouge | Port Arthur, Sabine Pass | Tampa | Total | Total all ports |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| December | 5,516 | 4,323 | 30,645 | 9,678 | 3,580 | 53,742 | .... | .... | .... | .... | 4,645 | 58,387 |
| January | 3,387 | 6,613 | 21,968 | 14,678 | 11,096 | 62,742 | .... | .... | .... | .... | 6,129 | 68,871 |
| February | 5,787 | 2,713 | 29,143 | 4,000 | 5,750 | 47,393 | .... | .... | .... | .... | 3,750 | 51,143 |
| March | 10,032 | 1,611 | 21,388 | 7,324 | 8,774 | 49,129 | .... | .... | .... | .... | 6,355 | 55,484 |
| April | 5,133 | .... | 19,200 | 16,500 | 10,067 | 50,900 | .... | .... | .... | .... | 4,000 | 54,900 |
| May | 4,452 | 3,064 | 19,903 | 11,226 | 6,258 | 44,903 | .... | .... | .... | .... | 2,356 | 47,258 |
| June | 4,267 | .... | 25,100 | 6,333 | 3,500 | 39,200 | .... | .... | .... | .... | .... | 39,200 |
| July | 6,774 | 1,194 | 24,612 | 11,065 | 9,902 | 53,548 | .... | .... | .... | .... | 1,225 | 54,903 |
| August | 3,452 | .... | 16,419 | 7,419 | 4,290 | 31,580 | .... | .... | .... | .... | 968 | 32,548 |
| September | 4,267 | 3,667 | 12,933 | 4,699 | 7,367 | 32,933 | .... | .... | .... | .... | 4,000 | 36,933 |
| October | 2,355 | 1,129 | 19,290 | 16,709 | 9,323 | 48,806 | .... | .... | .... | .... | 3,323 | 52,129 |
| November | 1,900 | .... | 22,800 | 11,567 | .... | 36,267 | .... | .... | .... | .... | 2,366 | 38,733 |

## GROSS PRODUCTION OF CRUDE OIL IN THE UNITED STATES FOR 12 MONTHS

(In Barrels of 42 Gallons)

| 1930— | | California | Oklahoma | Texas | Kansas | Arkansas | Louisiana | Rocky Mts. | Eastern | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| October: | Month | 18,244,052 | 16,632,523 | 23,626,553 | 3,517,912 | 1,626,552 | 2,142,885 | 3,225,550 | 3,627,000 | 72,707,029 |
| | Daily average | 588,518 | 536,533 | 762,147 | 113,223 | 52,792 | 69,125 | 104,050 | 117,000 | 2,345,388 |
| November: | Month | 18,109,459 | 14,941,770 | 22,035,232 | 3,459,330 | 1,557,870 | 2,136,948 | 2,957,100 | 3,222,000 | 68,419,699 |
| | Daily average | 603,648 | 498,059 | 734,507 | 115,311 | 51,929 | 71,231 | 98,570 | 107,400 | 2,280,656 |
| December: | Month | 17,786,728 | 15,057,103 | 21,810,359 | 3,432,661 | 1,590,951 | 2,157,534 | 3,118,663 | 3,328,000 | 68,281,999 |
| | Daily average | 573,765 | 485,713 | 703,560 | 110,731 | 51,321 | 69,598 | 100,602 | 107,355 | 2,202,645 |
| 1931— | | | | | | | | | | |
| January: | Month | 16,485,738 | 14,850,953 | 20,019,312 | 3,432,475 | 1,574,955 | 2,135,037 | 2,966,142 | 3,374,000 | 64,838,512 |
| | Daily average | 531,798 | 479,063 | 645,781 | 110,725 | 50,805 | 68,872 | 95,682 | 108,839 | 2,091,565 |
| February: | Month | 14,930,922 | 13,531,980 | 18,957,571 | 3,341,016 | 1,402,493 | 1,981,616 | 2,747,024 | 3,129,000 | 60,021,631 |
| | Daily average | 533,248 | 483,285 | 677,057 | 119,322 | 50,089 | 70,772 | 98,108 | 111,750 | 2,143,629 |
| March: | Month | 16,364,842 | 16,627,687 | 23,452,619 | 3,498,598 | 1,469,245 | 2,061,576 | 2,898,035 | 3,374,000 | 68,747,602 |
| | Daily average | 527,898 | 536,377 | 724,310 | 112,858 | 47,395 | 66,502 | 93,485 | 108,839 | 2,217,665 |
| April: | Month | 15,803,541 | 16,815,990 | 26,887,717 | 3,281,880 | 1,412,220 | 2,008,021 | 2,901,870 | 3,273,000 | 72,384,239 |
| | Daily average | 526,785 | 560,255 | 896,257 | 109,396 | 47,074 | 66,934 | 96,729 | 109,100 | 2,412,808 |
| May: | Month | 16,443,960 | 17,333,867 | 28,708,634 | 3,341,366 | 1,446,274 | 2,232,568 | 3,098,419 | 3,190,000 | 76,800,138 |
| | Daily average | 530,612 | 559,157 | 926,086 | 107,786 | 46,654 | 72,018 | 99,949 | 102,900 | 2,445,166 |
| June: | Month | 15,641,436 | 16,678,200 | 29,139,833 | 3,175,449 | 1,344,450 | 1,850,511 | 2,936,200 | 3,166,000 | 73,982,079 |
| | Daily average | 521,381 | 555,940 | 971,327 | 105,848 | 44,815 | 61,684 | 99,540 | 105,533 | 2,466,069 |
| July: | Month | 16,093,322 | 16,467,789 | 33,827,213 | 3,090,763 | 1,387,430 | 1,716,736 | 2,905,909 | 3,241,000 | 78,729,155 |
| | Daily average | 519,139 | 531,219 | 1,091,200 | 99,702 | 44,530 | 55,346 | 93,739 | 107,774 | 2,539,650 |
| August: | Month | 15,668,984 | 9,678,510 | 32,379,816 | 3,148,887 | 1,165,445 | 1,584,444 | 2,897,143 | 3,167,000 | 69,500,329 |
| | Daily average | 505,451 | 312,210 | 1,041,284 | 101,577 | 37,595 | 51,111 | 96,553 | 102,161 | 2,241,943 |
| September: | Month | 15,180,610 | 7,930,830 | 28,981,525 | 3,151,770 | 1,138,389 | 1,641,384 | 2,761,236 | 3,632,000 | 64,417,729 |
| | Daily average | 506,020 | 264,361 | 966,051 | 105,059 | 37,946 | 54,713 | 92,041 | 121,067 | 2,147,257 |
| Total 12 months | | 196,758,605 | 176,547,302 | 308,727,324 | 39,926,098 | 17,026,264 | 23,648,354 | 35,373,285 | 39,823,000 | 837,830,032 |